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In THE MUNICIPAL INDEX (an 875-page annual volume) readers will find much material, including articles, lists and bibliographies on a wide variety of municipal and civic subjects, not published in the monthly issues of THE AMERICAN CITY. THE MUNICIPAL INDEX is furnished to city and town purchasing officials without charge

See pages 23, 25, 141, 143 for notices of catalogs and publications on many municipal and civic subjects

For Index to Advertisements see page preceding back cover

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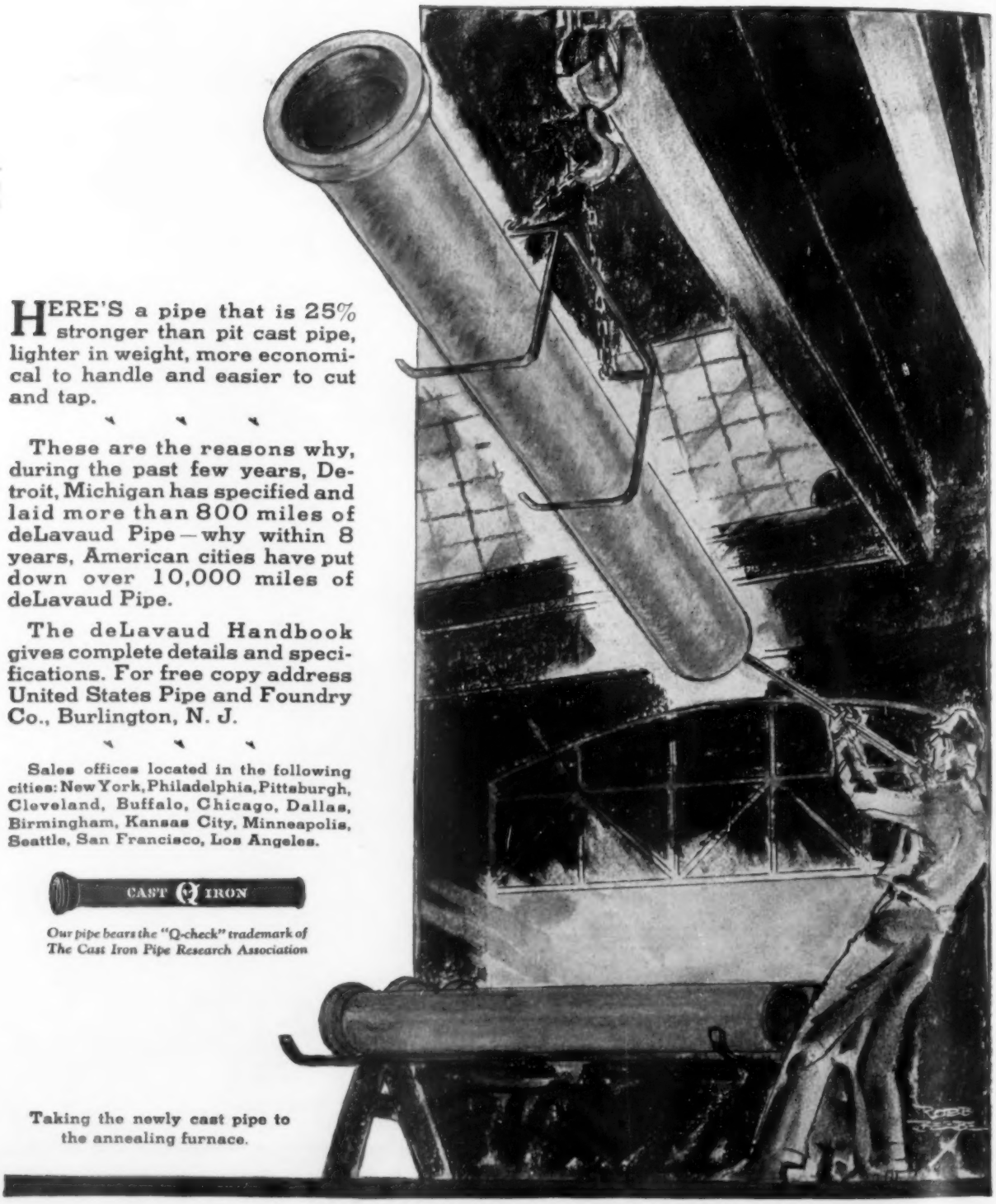

HERE'S a pipe that is 25% stronger than pit cast pipe, lighter in weight, more economical to handle and easier to cut and tap.

These are the reasons why, during the past few years, Detroit, Michigan has specified and laid more than 800 miles of deLavaud Pipe—why within 8 years, American cities have put down over 10,000 miles of deLavaud Pipe.

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Administrative Problems

Items for Mayors and City Managers

Original Municipal Research Bureau Affiliates with Columbia University

THE National Institute of Public Administration, formerly the New York Bureau of Municipal Research, has merged with Columbia University. The Bureau's original work in connection with the government of the city of New York, which was particularly intimate during the first ten years of its existence, has since been extended to over 100 cities on various occasions, and has also been broadened in the direction of surveying state governments.

The new connection with the University will involve no immediate change in the program or policy of the Institute, which will continue its corporate existence. Dr. Luther Gulick will remain at the head of the Institute; he has also been appointed Eaton Professor of Municipal Science and Administration at Columbia University.

For Lower Insurance Rates on Municipal Property

AFTER a careful survey and an exhaustive study of the cost of insuring city property in New York State, a committee of the Mayors' Conference has petioned the State Superintendent of Insurance to establish a new classification with lower rates applying to municipal risks. A survey in more than 40 per cent of the cities of the state shows that in the last ten years the total fire loss premium amounted to $785.076 and the total losses to $99,721, indicating an excess retained by the carriers of $685,355. The ten-year period studied showed a loss ratio of only 12.7 per cent. The report states: "Because of the excessive and unreasonable cost of fire insurance, which does not appear to be justified by the small loss ratio on public buildings, cities are impelled to seek relief in the creation of self-insurance funds or by the elimination of insurance on property they own."

"It is generally conceded that municipally owned properties represent, by virtue of substantial construction and by reason of safeguards afforded by careful and continuous supervision, less hazard and a lower risk than the average privately owned properties."

The petition further sets forth that the State Superintendent of Insurance is empowered to order a rate reduction whenever the profit derived for a period of five years is excessive.

The members of the conference committee were Mayor Norman A. Boyd of Binghamton, Mayor Frederic C. McLaughlin of White Plains, Mayor Livingston Platt of Rye, Mayor Herman Bergholtz of Ithaca, and Mayor Frank J. Clark of Gloversville.

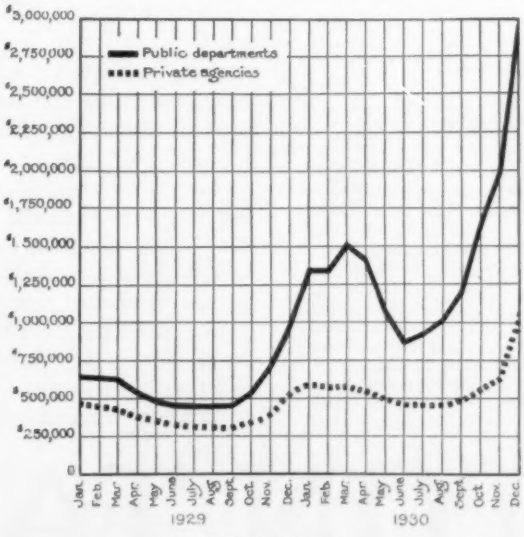
E. D. GREENMAN.

Huge City Expenditures for Family Relief

FIGURES compiled by the United States Children's Bureau for the President's Emergency Committee for Employment indicate that the cost of caring for families in need during 1930 in 100 representative American cities exceeded $40,000,000, including both public and private sources of funds. These cities, 60 of which are over 100,000 in population and the remaining 40 over 50,000, are of wide geographic distribution and of diverse economic and industrial characteristics. The 1930 expenditure was 89 per cent in excess of that for 1929.

For 75 of the cities, for which number a separation between public and private agencies is available, 72 per cent of the total amount came from the public treasury in 1930, and 60 per cent in 1929; and the increase in public expenditures from 1929 to 1930 was 146 per cent, while the increase in private funds was 48 per cent. This huge increase in public relief for this group was largely due to Detroit, the extensive relief program of which is overwhelmingly dependent on tax funds; but while the percentage of public money ranged from 98 in that city to zero in New Orleans and Washington, the total public expenditures, excluding Detroit, were still more than half of the total from all sources.

The accompanying chart, which, with the other data, is from the *Monthly Labor Review*, for April, shows clearly the rise in expenditures through 1929 and 1930 and the proportions of public and private funds.



FAMILY RELIEF

Trend of expenditures by public departments and by private agencies in 75 cities, 1929 and 1930

Recent City Manager Appointments

GEORGE F. BARNARD, a local druggist, was appointed City Manager of Benton Harbor, Mich., in April, succeeding H. L. Lynch, who had been City Manager since April, 1929.

R. E. Clement, a former City Councilman, became City Manager of Norman, Okla., in May. He succeeds John T. Hamill, City Manager since May, 1927.

John W. Hall resigned his position as City Engineer of Miles City, Mont., to become the first City Manager of Ventura, Calif., in April.

Floyd Klippel succeeded L. H. Sours as City Manager of Iowa Falls, Iowa, in April. Mr. Sours had been City Manager since October, 1927.

Howard F. Mace, City Clerk of Mexia, Texas, became City Manager of Mexia in April. He succeeds Ray D. Morgan, who had been City Manager for two years.

John L. McClelland was appointed City Manager of Oklahoma City, Okla., in April, succeeding Edmund M. Fry, City Manager since April, 1927. Mr. McClelland has been an automobile dealer and financier in Oklahoma City for several years.

J. Bryan Miller has resigned as City Manager of Lubbock, Texas, effective June 1, to become the first City Manager of Jacksonville, Texas.

Neil B. Pierson, formerly construction engineer in Oakland, Calif., became City Manager of Alameda, Calif., May 1. He succeeds Clifton E. Hickok, who had been City Manager since July, 1921.

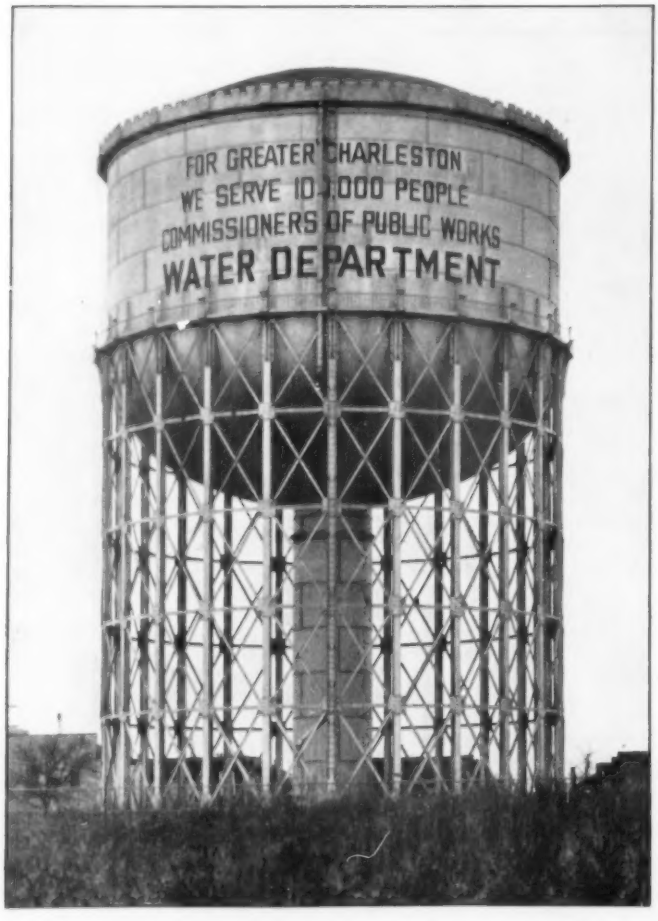
L. M. Robinson, a local osteopath, was recently appointed City Manager of Clarksburg, W. Va. He succeeds R. Linn Osborn, City Manager since August, 1927.

F. E. Shide succeeded Clyde B. King as City Manager of El Dorado, Kans., in April. Mr. King had resigned his position to become the first City Manager of Arkansas City, Kans.

B. F. Spicer has been appointed the first City Manager of Cleveland, Okla.

CLARENCE E. RIDLEY,
Executive Secretary, The International City Managers' Association.

Who enjoys torn-up streets?



The illustration represents the Horton ellipsoidal-bottom elevated tank used by the Water Department of Charleston, S. C. Its capacity is 2,000,000 gallons

IMPROVEMENT of water service often puts city officials and engineers in a difficult position. Citizens are complaining that pressures drop when they need the water the most and that fire protection is jeopardized. On the other hand, tearing up streets to enlarge mains involves heavy expense, inconvenience and traffic problems which nobody enjoys. What to do?

In both large and small municipalities the problem has been solved efficiently and economically by large elevated storage in Horton shallow-depth tanks. With one or more elevated tanks in the system, the capacity of existing mains is greatly increased. Water is pumped to storage when demand is low, for use during the hours when demand is greatest. Everyone has ample water at good pressure, at all times—and no changes in mains are necessary.

Horton large elevated storage tanks are in service in several cities of over a million population; on the other hand, large storage is used to advantage in cities as small as ten thousand population, with ordinary sizes universally used in cities, towns and villages throughout the country.

As an example of economy secured through the use of large Horton elevated tanks, an engineering survey for a city of 72,000 showed an annual cost with a million gallon tank of 17 per cent less than the lowest of three other possible expedients. The first cost of the Horton tank was also in line.

The shallow-depth design of Horton tanks plays an important part in keeping down the cost of waterworks operation. The pumping cost is less, because there is less variation in pressure in the tank to pump against.

We shall be glad to show you how other cities have improved water service at low cost with Horton tanks, and quote on tanks to fill your engineer's recommendations.

CHICAGO BRIDGE & IRON WORKS

Chicago	2127 Old Colony Bldg.
New York	3108 Hudson Terminal Bldg.
Cleveland	2236 Midland Bank Bldg.
Detroit	1501 Lafayette Bldg.
Philadelphia	2616-1616 Walnut Street Bldg.
Boston	1501 Consolidated Gas Bldg.
Birmingham	1501 Fiftieth St., N.
Dallas	1206 Burt Bldg.
San Francisco	1033 Rialto Bldg.
Seattle	4343 Smith Tower
Los Angeles	1303 Subway Terminal Bldg.
Houston	1101 Electric Bldg.
Tulsa	2425 Exchange Bank Bldg.
Havana, Cuba	Apartado 2507

HORTON TANKS

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Pure Water—Man's Greatest Need

Items on Water Supply and Purification

Water System of the Rockaways Purchased by New York City

NEW YORK CITY'S purchase of the plant and distribution system of the Long Island Water Corporation is the outcome of more than three years of campaigning by the 65,000 permanent residents of the peninsula and many of the summer residents of the Rockaways. The agreement was made on February 26. Under its provisions the Corporation retains possession of the buildings for six months for a $2,000 rental. To insure the return of deposits by customers, the company posted a $20,000 bond and, in turn, the city of New York agreed to furnish the company not more than 500,000 gallons of water a day to supply the residents of Atlantic Beach, this water to be returned by the company.

It is estimated that residents of the Rockaways will now pay only about one-third of the previous cost for water service in their homes; that is, instead of paying a total of about $30 a year for water, they will now pay about $10.

Milwaukee's Water Superior to U. S. Standards

THE water supply of Milwaukee, Wis., now conforms for the fourth consecutive year to the standards required by the U. S. Public Health Service for common carriers. As recently as 1926 Milwaukee's water was considered highly contaminated. In October of 1926, Dr. Koehler, Health Commissioner of Milwaukee, in a communication to the Common Council, warned that the drinking water was unfit for human consumption about one-third of the time and that it not only did not meet U. S. Public Health standards, but was five times worse than the minimum requirements of the Government Public Health Service.

The year 1927 was the first in which the water met U. S. standards. In his 1927 Annual Report, Dr. Koehler said: "One of the most encouraging and valuable achievements to report for the year 1927 is the great improvement of the city's water supply. This improvement began during the year 1926, but was more marked during the year 1927. Up until 1926 the water supply of Milwaukee was never able to meet the U. S. Public Health requirements for an entire year. During the year 1927, Milwaukee's drinking water more than met the Government standards. It was rarely that the water showed any pollution."

Since 1927 the city's water tests have annually averaged far superior to the U. S. standards. Only eight of the monthly averages were below the standard for the three bacteriological tests during the years 1927 to 1930, inclusive.

R. W. Cunliffe, Director of Laboratories and Research of the Milwaukee Health Department, in his 1930 Annual Report, makes the following comments: "The average bacterial counts of both the raw and treated water are the best in the city's history and undoubtedly the result of the continuous and fairly efficient operation of Milwaukee's activated sludge sewage disposal plant and continuous, efficient and effective chlorination."

A New 5,000,000-Gallon Reservoir for Provo, Utah

BECAUSE of the dry summer of 1930, the 135 mountain springs from which the city of Provo, Utah, takes its water supply, were running at 50 to 60 per cent of normal and threatened the city with a water shortage. To remedy this, the city has recently completed, at a cost of $90,000, a 5,000,000-gallon underground gallery type reservoir to be used for regulating purposes. This type was chosen because of the claim of the city that its culinary water never sees the light of day from the time that it leaves the springs in the canyon until it comes out of the taps in the homes of its 15,000 inhabitants.

The site for the reservoir is three miles north of the city at the mouth of Rock Canyon, which has an elevation of 292 feet above the city. Bids were received on July 20. On August 14, T. G. Rowland, of Salt Lake City, was awarded the contract for the construction.

A concrete slab floor 206 feet in diameter and 8 inches in thickness, fully reinforced with steel, was laid. In order to support the walls, footings 16 feet 4 inches wide and 15 inches in thickness, also heavily reinforced with steel, were poured in the same operation as the cantilever walls, tapering from 28 inches at the bottom to 10 inches at the top. The walls were poured in six sections with expansion joints at a water stop of 14-gage copper.

In order to support the 8-inch slab top and 18-inch dirt covering, which will eventually be planted as a lawn and form a part of the city park project in the vicinity, 140 reinforced concrete columns were placed at 15-foot intervals.

A total of 3,144 cubic yards of portland cement concrete was used. A 1:2:3 mix was used for the walls and footings, and a 1:2:4 mix for the rest of the project.

In order to prevent the damp concrete surfaces from being exposed to freezing weather, the floor and top were covered with a 1½-inch coating of bituminous compound alternated with three layers of canvas. The walls and the columns were painted with boiled linseed oil.

Two 30-inch air vents have been provided for aeration and are so constructed as to prevent sediment from getting into the supply. The water will enter the bottom of the reservoir through a 30-inch intake pipe and will leave through two outlet pipes, also from the bottom, one 12 inches in diameter and the other 20 inches in diameter. A 12-inch overflow pipe has been placed one foot from the top of the reservoir.

FRANK DEMING,
City Engineer.

New Tank at High Point Supplements One 30 Years Old

THE city of High Point, N. C., secures its water supply from an impounding reservoir on Deep River about 2 miles northeast of the city. The water flows from this reservoir, which has a capacity of 1,600,000,000 gallons, to a raw-water pumping station below and is pumped to the filtration plant located within the city limits.

The filter plant is of the rapid sand type and has a capacity of 6,000,000 gallons per day. It also has two unequipped filter units of 750,000 gallons per day capacity, giving an ultimate capacity of 7,500,000 gallons per day.

The pumping equipment at the raw-water station includes two 1,500,000-gallon-per-day and two 3,000,000-gallon-per-day electrically driven centrifugal units, and one 4,000,000-gallon-per-day centrifugal standby unit driven by a 300-horsepower engine. There is also a duplicate of this pumping layout at the filter plant to pump the filtered water into the mains.

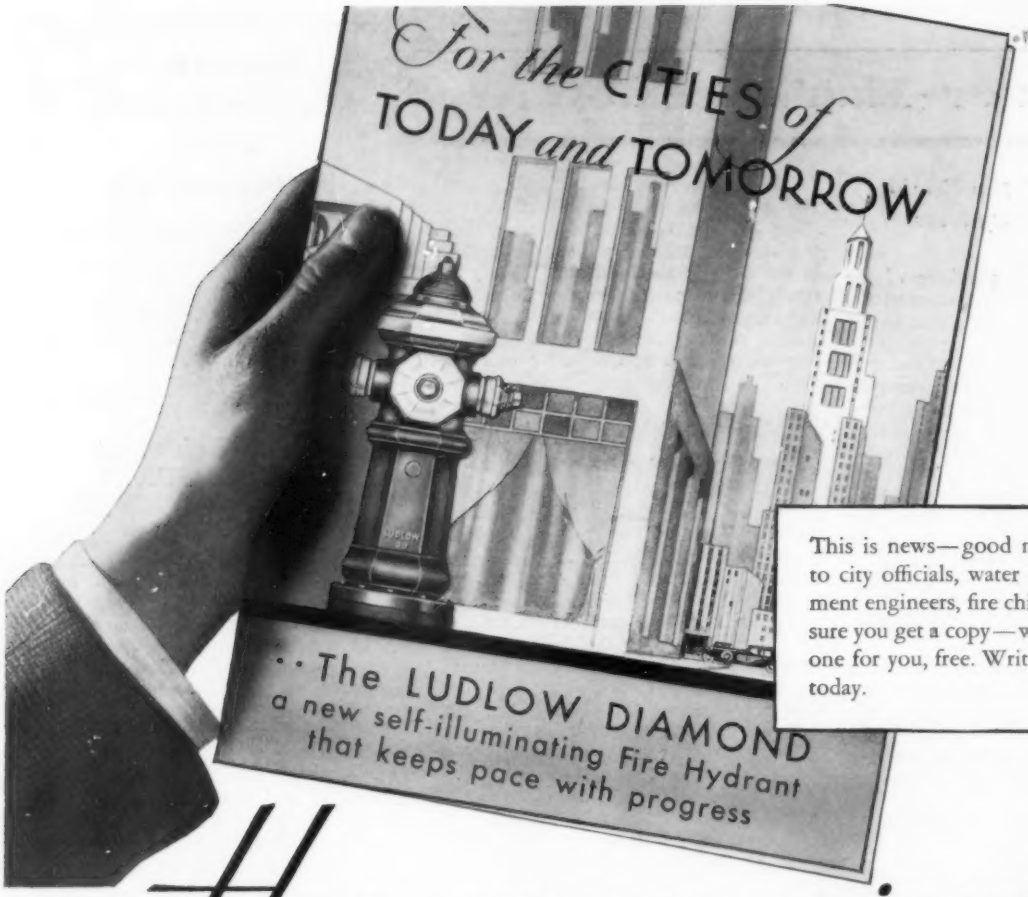
The city has a population of 36,742 and covers an area of 9.75 square miles. The distribution system contains 150 miles of mains, including 2.75 miles of 24-inch and 0.25-mile of 16-inch transmission mains. The system serves approximately 6,000 customers, 300 of which are industrial, the system being 100 per cent metered.

The average daily consumption is 2,250,000 gallons, with a maximum rate of 4,000,000 gallons and a minimum rate of 1,500,000 gallons per day.

A 150,000-gallon Horton elevated tank installed in 1901 at about the center of the city is still in service. In addition, a new 1,000,000-gallon Horton elevated tank was put into service in December, 1930. This tank is located in the southwestern part of the city.

Graphic charts from a recording gage at the center of the city showed a wide variation in pressure before the installation of the tank, and have showed a practically uniform pressure of approximately 68 pounds since its installation. Since the tank has been in service, the pumps have been operated at a uniform rate of 80 pounds pressure.

P. J. DISHNER,
Director of Utilities.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TODAY and TOMORROW
The LUDLOW DIAMOND
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that keeps pace with progress

This is news—good news—to city officials, water department engineers, fire chiefs. Be sure you get a copy—we have one for you, free. Write for it today.

Have you received your copy of this new folder?

This hydrant is *news* — good news — to city officials. Its handsome design is in keeping with the newer architecture and the improvements in modern street lighting. Its octagonal dome and caps provide extra light reflecting surfaces that mean quick pick-up — saving precious seconds. Its three-part construction permits replacement without digging — cuts costs, lowers inventories. And its improved valve mechanism will not flood even when the hydrant is broken off.

A cost of less than 2c per unit per year for repair parts, is the record established during half a century by 8,000,000 Ludlow Valves and Hydrants in over 3,000 cities and towns, proving that Ludlow quality insures *lasting* economy.

The TRADE LUDLOW MARK **VALVE MFG. CO.**
TROY · NEW YORK
MAKERS OF *DEPENDABLE* VALVES AND HYDRANTS SINCE 1866

LEON A. SMITH
Supt., Water Works
Madison, Wis.
Director, American Water Works Association

J. WALTER ACKERMAN
City Manager
Fall River, Mass.
Director, American Water Works Association

JACK J. HINMAN, JR.
Asso. Prof. of Sanitation, University of Iowa, Iowa City, Iowa
Director, American Water Works Association

SAMUEL B. MORRIS
Chief Engr., Water Dept.
Pasadena, Calif.
Director, American Water Works Association

Who's Who in Water Supply

The 41st of a Series of Portraits of Water Works Officials Which Has Appeared Monthly Since January, 1928

ALBERT B. BAUMANN
Water Commissioner
Mannington, W. Va.
(Appointed 1921)

H. R. SLOCUM
District Mgr., Central West Public Service Co.
Hot Springs, S. Dak.
(Appointed 1928)

C. E. KRAUSE
Water Commissioner
Blair, Nebr.
(Appointed 1922)

EUGENE A. ROBERTS
Mgr., Southwestern Public Service Co., Carlsbad, N. Mex.
(Appointed 1925)

WALTER F. SANDERS
Mgr., Water Dept.
Plymouth, Wis.
(Appointed 1928)

EDWARD C. LOCKE
Supt., Water Dept.
Edenton, N. C.
(Appointed 1931)

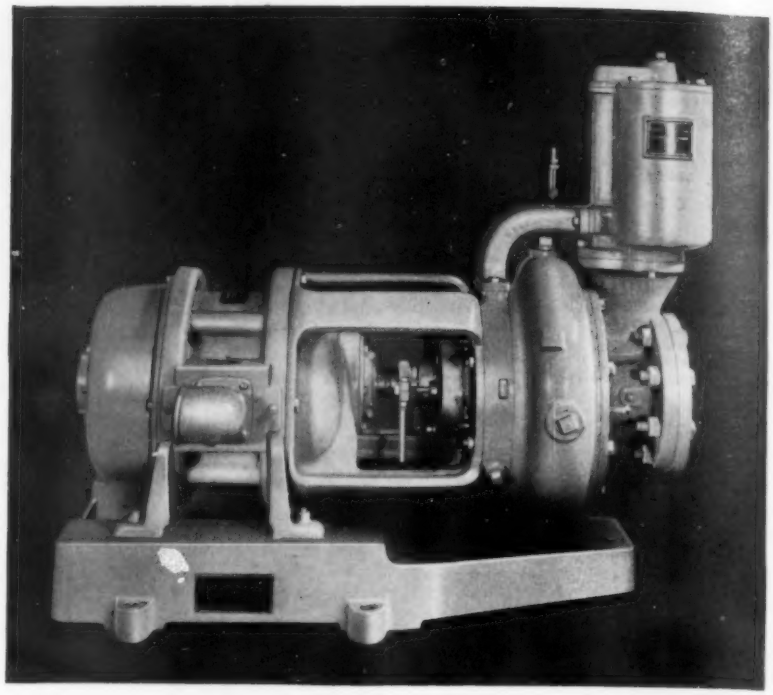
E. C. MORRISON
Mgr., Water Plant
Bennettsville, S. C.
(Appointed 1904)

CLIFFORD BARTON
Mgr., Water Plant
Forrest City, Ark.
Appointed 1922)

JACK TREDWELL
Supt., Water Works
Siloam Springs, Ark.
(Appointed 1923)

B. SOYARS
Supt., Water Works
Russellville, Ky.
(Appointed 1925)

THIS SEWAGE PUMP



is installed OUTSIDE *the pit!*

ONLY the suction pipe of the Jennings Suction Sewage Pump is submerged. All the working parts... pump, motor and controls... are installed out on the floor, away from the pit.

There is never any need to go down into the pit to get at a Jennings. Inspection or cleaning can be accomplished easily and quickly from the floor. By simply unbolting and lifting off the pump head, the entire interior of the pump is laid open. The impeller can be removed without disturbing packing or shaft alignment.

Wherever a pump is required for pumping sewage to the disposal plant, transferring sewage at various stages of treatment, removing seepage from ejector pits or handling waste and drainage in pumping stations, the Jennings can be depended upon for years of good service.

Jennings Suction Sewage Pumps are furnished in capacities and heads to meet all the usual requirements. Write for Bulletins 113 and 124.

NASH ENGINEERING COMPANY
14 WILSON ROAD . . . . SOUTH NORWALK, CONN.

Jennings SUCTION SEWAGE *Pumps*

Sewage Treatment Means Clean Streams

How Massillon Solved the Infiltration Problem

MASSILLON, OHIO, like many other cities, found out some years ago that the subject of infiltration of ground water in sanitary sewers was not receiving adequate attention. Studies and investigations were made as to the best method of coping with this problem in future construction. In 1923, the sanitary sewer construction specifications, for the first time, carried a clause providing for a maximum infiltration of 25,000 gallons per mile per day and all construction was checked before final acceptance of the job to determine infiltration figures. From that time until 1925 only two cases were found where the infiltration exceeded this maximum figure, and in most cases infiltration was around 12,000 gallons per mile per day. In the two cases mentioned, the contractor was required to remedy the defect, or the city did the work, deducting the cost from his final estimate.

In 1925, a provision was adopted which required all joints to be made with an improved bituminous joint compound, either poured in place or a pre-formed joint. Immediately after adopting this regulation, it was found that infiltration on new construction dropped to practically nothing and it now has ceased to be a problem. Measurements taken since 1925 indicate that there is an average infiltration of 3,000 gallons per mile per day, and the city is satisfied that most of this comes from manholes rather than from pipe joints. Practically all joints up to and including 15-inch pipe have been Presstite pre-formed joints and, from that size up, a poured joint has been used. In all cases where sewers go under stream beds, the sewer barrel is encased in concrete one foot thick to protect it from breakage through a washout or other accidental damage.

In storm-sewer construction a portland cement joint is used, as the matter of infiltration is not a troublesome one. A large amount of segment block construction has been used in recently constructed large-diameter sanitary sewers. These were of course laid with portland cement joints, and have been found to be practically water-tight. Concrete pipe has not been used for sewers in Massillon, because of the presence of pickling acids in the sewage.

Since 1923, it has been the practice in building a sewer to extend the laterals for house connections to the curb line at the same time, making the joints of the same material as in the main sewer. Many complaints were received during 1923 regarding poorly constructed house laterals from the curb to the building, due to unwiped joints, open joints, poor alignment or grade, etc. The Engineering Department during that year had an ordinance adopted by the City Council putting the construction of all house laterals from the city's construction at the curb, or in the case of old sewers, from the main to the building, under the direct supervision of the Engineering Department and requiring a permit to be taken out by a licensed sewer builder, the actual laying of the pipe to be done in the presence of a city inspector. This inspector keeps a complete record on the back of a carbon copy of the permit, which is filed in the engineering office after the completion of the job.

The licensed sewer builders are also under a surety bond of $1,500 guaranteeing compliance with the city ordinance. In the few cases where trouble has resulted from poor workmanship, the matter has been satisfactorily adjusted for the owner at no additional expense to him, through the ordinance provision giving the Service Director authority to cancel licenses if the builder refuses to live up to the ordinance.

In 1928, when it was found that laterals from the curb line to the building were permitting an undue amount of infiltration, the city determined to require the house laterals to be laid with bituminous joints. This has been a further advance in better work and has been found satisfactory to both the city and the property owner, and it has not been found to increase the cost of the job as a whole.

Although some trouble is experienced with roots entering old sewers and causing clogging, no such trouble has been experienced in sewers built with bituminous joints.

C. E. RICE,
City Engineer.

Repairing and Relining Sewers with Concrete

IN repairing old and worn-out sewers in the city of St. Louis, Mo., the Sewer Department, under Ernest H. Paffrath, Assistant Sewer Commissioner, resorted to sand-blasting the inside surface of the sewer so as to remove all foreign substance from the surface of the brick or masonry, so that the Gunite might have a better bond.

THE 350-FOOT PORTABLE AIR-COMPRESSOR USED IN RELINING SEWERS IN ST. LOUIS

For sand-blasting, the regular Gunite nozzle is used, with the addition of a piece of ½-inch pipe screwed into the end of the nozzle. For this purpose a Buhl 300-foot portable air-compressor is used, mounted on a trailer made from parts already at hand.

After sand-blasting is completed, the Gunite is applied with a Cement-Gun which is operated with one of the compressors. An entire new lining of cement mortar is forced into the open joints, as well as covering the entire surface of the inside of the sewer. By using a Cement-Gun, it is of course not necessary to use concrete forms, as the force imparted by the compressed air rams the cement into a hard, compact mass, which, tests by the city indicate, is about double the strength of the ordinary cement mortar applied by hand.

The compressor was purchased by the city of St. Louis through the Corby Supply Co., distributors, of that city.

Catch-Basin Cleaning to Be Done by Machine in Oak Park

THERE are 3,500 catch-basins on the sewer system of Oak Park, Ill., all of which were formerly cleaned by hand, the material being removed and placed on the pavement and later hauled away by trucks. Under this process catch-basins were cleaned about every other year.

It was recommended that an Auto-Eductor be purchased for cleaning the catch-basins mechanically and removing the contents to a truck in one operation. In December, 1930, an Elgin Auto-Eductor mounted on a Diamond-T chassis was purchased, the use of which will permit all catch-basins to be cleaned twice a year, if necessary. The machine can also be used for street flushing, for snow plowing and for tree spraying.

During 1930, 2,425 catch-basins were cleaned by hand, 913 cubic yards of dirt being removed at a total cost of $2,780.10, or $1.146 per catch-basin.

DUDLEY C. MEYERS,
Commissioner of Public Works.

Catch-Basin Cleaning in Aurora

CATCH-BASIN cleaning in Aurora, Ill., is done both by hand work and by the use of an Elgin Auto-Eductor. An average of about 1,000 basins are cleaned each year at an average cost of $4 per basin. About ½-cubic yard of material is removed from each basin, the material being dumped in a quarry for disposal.

FRANK BIEVER,
Commissioner of Streets and Public Improvements.

The FORD GARBAGE TRUCK

gives long service at low cost

Ford garbage truck

THE Ford garbage truck was developed especially for municipalities and contractors. Its strong, rugged construction, and simplicity of design throughout insure long life and reliability. Because of its low first cost, and low cost of operation and maintenance, this truck offers a high degree of economy.

Other Ford types built especially for municipal use are the dump truck, police patrol, ambulance, and service-car. 38 standard color-combinations are available without extra cost. It will pay you to investigate the economy of hauling with Fords. In principal cities there are centralized exhibits of Ford commercial units.

This truck is designed for hard, constant service. A heavy hydraulic hoist is provided for raising the body rapidly to the dumping position. The design of hoist-lifting mechanism provides greatest lifting force at the beginning of the lift where greatest effort is required; as body elevates, and less effort is required, the lifting force is correspondingly reduced with proportional increase in lifting speed. The body is of steel, and is reinforced and welded at all joints. The front end has a channel at the top to prevent garbage from splashing against the cab. Three rings at the bottom of the body, on each side, permit the use of a canvas cover and tie-rope. This truck is available with either two or three cubic yards capacity.

A 4-speed transmission provides a wide range of speed and power, giving ample power for carrying a full load over soft ground, and speed to cut down the time when trucks are returning light. Large, fully enclosed 4-wheel brakes, and Triplex shatter-proof windshield, provide a high degree of safety. Dual rear wheels, available at small additional cost, provide increased tire-economy.

Ford

Do you mention THE AMERICAN CITY? Please do.

Construction and Maintenance

Engineering and Highway Departments

Retread Work in a Michigan County

DURING 1930, Leelanau County, Mich., placed 111,747 square yards of 1-inch bituminous retread on its county roads on a base of well-maintained gravel. In doing the work a quick-setting asphalt emulsion was used with ¼- to ⅝-inch pea-gravel for the aggregate. To retread with asphalt emulsion, which is used cold, requires a somewhat different method of aplication than when using hot material. Immediately after it is applied, the emulsion breaks from the asphalt and starts to set.

In doing the work, the following procedure was followed: The surface of the road was first bladed thoroughly to shape and smooth it, after which it was cleaned of all dirty and loose material. (The road should be given special maintenance care the year previous, to keep it smooth and up to the proper cross-section, as this has a great deal to do with the finished riding surface of this type of road.)

All weak and low spots were then repaired and brought up to proper cross-section, and the surface was ready for the aggregate. One-half inch of pea-gravel was then placed uniformly over the road and watered freely ahead of the distributor, so that when the emulsion was applied, each stone was more evenly coated and penetration was aided. The emulsion was applied at the rate of ½-gallon per square yard, and was rapidly followed by another ½-inch of pea-gravel on the freshly applied emulsion. The surface was then rolled with 5- or 10-ton rollers, this rolling continuing for ten hours or more to key the surface tightly and evenly.

The second application was made by again watering the surface and applying 0.4-gallon of emulsion per square yard. This was immediately covered with just enough fine aggregate to cover the surface, and the road was again rolled for ten hours or more.

It is necessary that the road be rolled continuously while taking its initial set, to insure proper bonding of the materials and to get a smooth-riding surface. It is better to keep traffic off the road at least one day until the road is partly set, and then to allow light traffic to travel over the road at a speed of not more than 25 miles an hour, with the caution not to apply the brakes too quickly, as this might injure the surface. Allowing light traffic to use the road helps to iron down the surface before it is completely set.

In laying 111,747 square yards of this type of surfacing during 1930, the county used about 102,938 gallons of bituminous material, or 0.92-gallon per square yard. The amount of pea-gravel used per square yard was about 102 pounds, this being hauled an average distance of 7½ miles. The average cost per square yard was $0.2656, or $2,804.74 per mile of 18-foot road.

Although very good results have been obtained with pea-gravel, it takes more bituminous material to coat, penetrate and bind it, as there are so many small stones. For this reason, the county will use graded, screened and crushed aggregate in the future. It is planned to use approximately 70 pounds per square yard of screened, crushed and washed aggregate passing a 1-inch screen and retained on a ⅝-inch screen for the first or base course, followed by an application of 0.5-gallon per square yard of emulsion. The second application will amount to 22 pounds per square yard of aggregate passing a ⅝-inch screen and retained on a ⅜-inch screen, which will thoroughly fill the voids in the first course, followed by an application of 0.4-gallon of emulsion per square yard and covered with a final application of fine aggregate at the rate of 10 pounds per square yard.

MILLER BIDLEMAN,
County Highway Superintendent.

Indiana Provides Work for Drought-stricken Farmers

MORE than 600 men and 193 teams were provided work in January, February and March by the Indiana State Highway Commission as its contribution to drought-stricken farmers. Many men are still employed and will continue until more profitable employment is secured or the projects are completed.

Working in cooperation with Governor Leslie's Drought Relief Committee, the Maintenance Division of the State Road Department employed men and teams whenever and wherever grading and dragging could be done. Owing to the open winter, this program was of material financial aid to the heads of hundreds of families in southern Indiana.

According to John J. Brown, State Highway Director, the extra labor and teams were in addition to the regular forces employed by the Highway Commission and, in each case of relief employment, the Commission engaged only men actually in need of work as certified by the Drought Relief Committee.

Speaking of the relief program in the Seymour District, C. W. McClain, District Maintenance Engineer, said he employed approximately 250 men and 75 teams. This work was divided into several projects. On Road 64, east of Milltown in Harrison County, a grading project used 60 men and 25 teams. They worked two weeks, a new gang came on for two weeks, and then men and teams again alternated. By this plan work was divided among nearly all the needy in this immediate vicinity, where the call for work was more insistent than in some localities.

Some trouble was experienced at first in procuring teams with sufficient strength for this hard work, because the horses were underfed. According to Mr. McClain, the animals improved remarkably with the extra food given them after their owners drew their first money.

The demand for employment lessened in these farm areas with the approach of the season when the farmers were able to work in their fields. The several months' winter work, however, was of material aid to the farmers sustaining heavy losses from drought, and the state road program instituted for their relief has been of great benefit.

Director Brown states that maintenance work is starting on state roads all over Indiana, and in March the Highway Department had 1,752 men on the Maintenance Division payroll. This number will increase gradually until the maximum of 3,200 men used in the summer rush is attained. Regular employees will be augmented this year through a plan of holding to an 8-hour-day schedule instead of a 9-hour-day as customary. By this method, 300 or more men can be added for regular employment without additional cost to the Department. Drought relief work inaugurated by the Highway Commission aided those employed to the aggregate of $75,000, highways officials said.

Which City Has the Most Paving Per Capita?

RECENTLY the little town of Mayfield, Ky., claimed the United States title for the most paving per person. Immediately a newspaper publisher in Frankfort, Mich., searched out the paving facts on his town and learned that there was 0.07-foot more pavement per person in his city than in the Kentucky town. And now comes Glen Ellyn, Ill., as a claimant for the world's title, with 13 feet more pavement per inhabitant than the other cities.

Glen Ellyn, with a population of 7,628, has concrete pavements totaling 534,960 square yards. This gives 27.7 lineal feet per person. However, Glen Ellyn is a suburb of Chicago, and a comparison with a typically rural town like Frankfort may be considered somewhat unfair. Frankfort's paving, all of which is concrete, has been laid during the last 7½ years.

Much of Glen Ellyn's pavement was laid in 1915 and 1916 and is still giving excellent service. All of this paving is also concrete, which has resulted in low maintenance costs. The maintenance work is done by three men who work an average of 8 hours for 8 weeks at 60 cents per hour, which, with the cost of materials, brings the yearly bill to about $1,365, an average cost of $34 per mile.

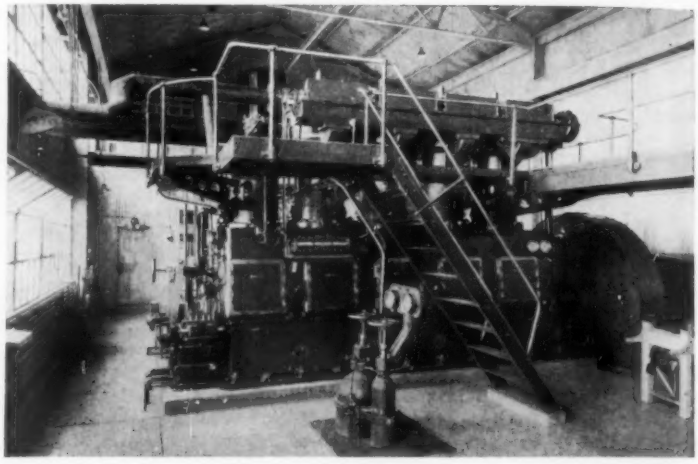
60 McIntosh & Seymour Engines totaling 29255 hp. bought during 14 years by one customer alone

That is the record of purchases by The Prairie Pipe Line Company between June, 1916, and September, 1930, for its pumping stations.

DIESEL engines get no severer test than in pipe line pumping service, where they are called upon to carry a heavy load 24 hours per day for weeks or even months without shutdown, and must then be ready for the next run on short notice. Interruptions are not permissible as power weakness at one station slows down the whole line, yet—little reserve capacity can be installed, as the cumulative cost of spare prime movers for all stations would be excessive. Sustained high economy also is compulsory, as slight deterioration at each engine would make a big difference in the total annual fuel costs. To add to these rigid restrictions, the prime movers are usually compelled to burn the cheapest of fuels, must often be located in dusty surroundings or where the water supply is scant or impure, and are sometimes moved from one station to another when new fields are opened or when production and demand change.

McIntosh & Seymour Engines bought by The Prairie Pipe Line Co. 1916 to 1930 incl.

Date	No. of Units	Total Horsepower
1916		
June	3	1285
Oct	1	500
1917		
April	2	570
May	2	785
Nov	2	1330
1918		
July	1	500
Sept	3	1500
Oct	4	2660
1919		
Aug	3	1200
Nov	2	1330
1920		
Mar	5	2665
1921		
Aug	1	600
Sept	1	665
Dec	6	2400
1922		
Mar	1	400
Sept	1	600
1925		
Mar	1	75
1926		
Aug	2	800
1927		
May	3	2400
1929		
Jan	7	5000
Mar	6	1000
May	1	80
Nov	1	110
1930		
Sept	1	800
TOTAL	**60**	**29,255**



Typical installation in a pipe line pumping station

The superior economies and dependability of McIntosh & Seymour Engines are universally conceded in the oil-pipe-line industry. They are convincingly indicated in the case of The Prairie Pipe Line Company by almost continuous repeat installations throughout a 14-year period, and after the long-time satisfaction of many older units was a matter of record.

Diesel engines that measure up to oil-pipe-line pumping requirements easily meet the needs of municipal, public utility and industrial power plants. If you need more dependable and cheaper power or are figuring on a complete new plant, investigate McIntosh & Seymour Diesel Engines, and let our Engineers explain and prove Diesel possibilities.

McINTOSH & SEYMOUR CORP., AUBURN, N. Y.

Division of **American Locomotive Company**

New York City, 30 Church Street
Kansas City, Mo., 1016 Baltimore Ave.
Washington, D. C., 910 Seventeenth St., N. W.
Houston, Tex., 2804 Esperson Bldg.
San Francisco, 514 Matson Bldg.

McINTOSH & SEYMOUR DIESEL ENGINES

JOSEPH S. STRINGHAM
City Engineer
Detroit, Mich.
(Appointed 1931)

RICHARD S. BURNETT
Supt. of Roads and Bridges,
New Hanover County
Wilmington, N. C.
(Appointed 1913)

LEO E. KOEHLER
County Surveyor, Jackson Co.
Kansas City, Mo.
(Appointed 1920)

JOHN A. SHISLER
City Engineer
Canton, Ohio
(Appointed 1930,

WILLIAM H. ROGERS, JR.
County Hghway Engr., Pitt Co.
Greenville, N. C.
(Appointed 1923)

Who's Who in City & County Engineering

One of a Series of Portraits of Engineering Officials Which Has Appeared Monthly Since April, 1928

LLOYD McC. ROSS
Highway Engr., Mecklenburg Co.
Charlotte, N. C.
(Appointed 1921)

FLOYD E. WOMBLE
County Surveyor, Chatham Co.
Siler City, N. C.
(Appointed 1918)

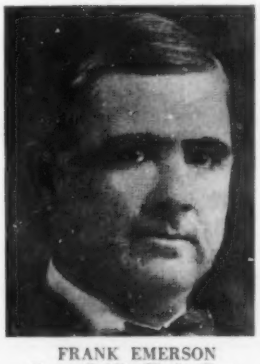
GEORGE S. ARNOLD
County Surveyor, Dallas Co.
Louisburg, Mo.
(Appointed 1929)

LELAND C. ANGEVINE
City Engineer
McPherson, Kans.
(Appointed 1921)

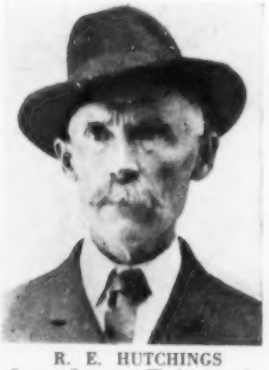
PAUL C. SHAFER
City Engineer
Ravenna, Ohio
(Appointed 1928)

FRANCIS H. DRYDEN
City Engineer
Salisbury, Md.
(Appointed 1920)

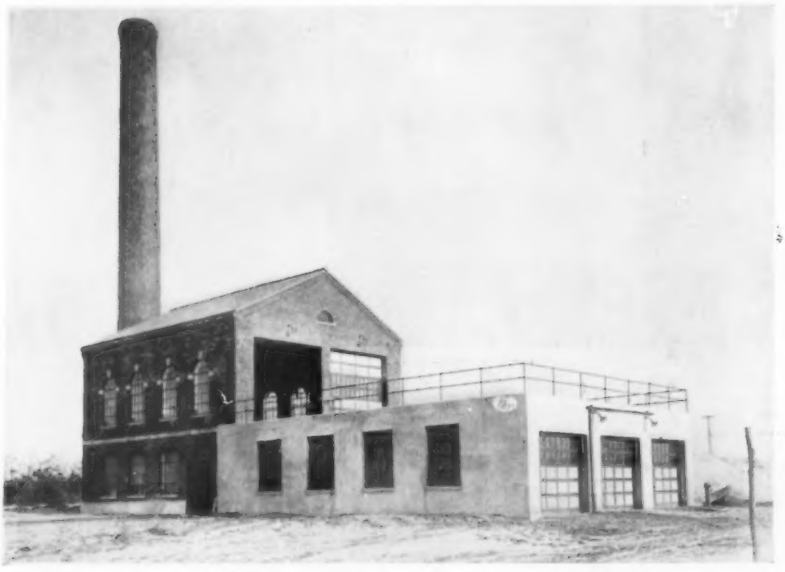
CLAUDE W. ASHER
City Engineer
Mount Airy, N. C.
(Appointed 1926)



FRANK EMERSON
Supt., Public Works Dept.
Melrose, Mass.
(Appointed 1925)



R. E. HUTCHINGS
County Surveyor, Washington Co.
Potosi, Mo.
(Appointed 1912)



Patchogue, Long Island, owns a typical small-city Morse Boulger plant. 60 tons capacity, in two destructor units, provides for summer peak loads and future growth. View shows ample turning platform for trucks at end of approach driveway; garage underneath. Lower photograph shows wide entrance doorways and well-lighted interior. Built in 1930. Consulting Engineer, Cyril E. Marshall, Hempstead, Long Island.

Give your modern city . . . .

this modern kind of incineration...

Clean
Economical
Complete

Morse Boulger incineration settles your disposal problem, once and for all. Thirty years of engineering experience is back of it. *Clean*—trouble-free performance, regardless of what kind of refuse you may have. *Economical*—efficient use of fuel value from combustibles in refuse, heavy-duty construction, tested materials. *Complete*—no unburned residue; high temperatures, proper air supply, long travel of gases in high-temperature area—positive combustion. You are *sure* of results . . . with Morse Boulger equipment. May we send you complete literature? Morse Boulger Destructor Co., Inc., 205C East Forty Second Street, New York, N. Y.

HEAVY-DUTY INCINERATION
MORSE BOULGER
DESTRUCTORS

METHODS and COSTS of REFUSE COLLECTION and DISPOSAL

Problems of Garbage Collection in Beverly Hills

BEVERLY HILLS, CALIF., has a somewhat different and very effective system of garbage collection. Two trucks of 2½ tons capacity are used. They have flat-bottom bodies and each carries two movable heavy steel tanks, 6 feet long, 4 feet wide and 3 feet deep, giving a capacity of 72 cubic feet each.

The trucks cover the business section daily and the residential areas twice a week. One truck with the driver and two helpers operates six days a week and the other truck with driver and two helpers operates four days a week. Approximately 350 tons of garbage is collected each month, averaging 14 tons a day for the 25 working days.

All garbage is required to be wrapped in paper and carefully segregated from tin cans, bottles, etc. The metal containers are placed in the alleys for collection, and the contents are transferred to the large steel tanks on the truck. When the truck returns to the city yard, the loaded tanks are removed by an electrically operated crane, the empty tanks are placed on the truck and it is ready to return immediately to the collection route. The loaded tanks are covered with heavy canvas when the trucks travel on the streets, and this, together with the wrapping of the garbage, permits it to be transported entirely without offense.

The city receives $228 a month for the garbage from a contractor who uses it on a hog ranch. The contractor, using a heavy-duty truck and a large trailer, removes the accumulated tanks daily, covering them with canvas for transportation through the city.

The collection of rubbish, which is composed mostly of grass, shrubbery and tree trimmings from the large estates of the city, averages 37 tons daily, with the cost of collection approximately $2.01 per ton. Four trucks are operated eight hours daily, with three men to a truck on general rubbish collection. One truck operates eight hours daily with a crew of two men on ashes and sweepings, and one truck operates daily with two men on ashes and miscellaneous débris in the alleys.

Papers are collected from business houses daily. Papers and other inflammable materials, such as grass cuttings and shrubbery, are collected once a week from the residential districts. Tin cans, bottles and non-combustible materials are collected once a week from the entire city.

The city has recently made a new contract for disposal of tin cans and bottles after they have been collected and concentrated at the city yard, paying a contractor $139 monthly for disposing of them outside the city.

At the beginning of 1931, the city added a nightly collection of rubbish from 8 P.M. to 4 A.M., using three trucks with three men each, and operating the incinerator during these hours with one operator and one helper. A lapse of four hours is allowed between shifts, to give the operators time to clean the incinerator and service the trucks.

The incinerator has a designed capacity of 20 tons daily, but is being operated satisfactorily in burning twice that quantity of rubbish. Department collection averages 37 tons daily, and the Park Department trucks bring in trimmings from the tree-lined parkways of the city. Business houses also bring rubbish direct to the incinerator. The incinerator is thus burning approximately 40 tons of rubbish daily at an approximate cost of 59 cents per ton for operation and maintenance. One operator and one helper for each eight-hour shift are required.

WILLIAM R. METZ,
City Engineer.

Garbage Disposal by Incineration Studied in Hanover

AT present, garbage and rubbish are collected and disposed of by individual collectors in Hanover borough, Pa., at a charge of 10 cents per week to each householder.

The garbage is fed to hogs, and rubbish and other trash are dumped in old stone quarries two miles from the borough. As long as it is possible to dump the waste materials in quarry holes, the present method of disposal will be satisfactory to the municipal authorities. However, a study has been made by the office of the Borough Manager during the past year to recommend to the Council when the time comes the disposal of both garbage and waste by incineration.

C. A. ECKBERT,
Borough Manager.

Department of Health Responsible for Street Cleaning and Garbage Collection

THE Department of Health of University City, Mo., takes care of the cleaning of the streets, and the collection of rubbish and garbage. At the present time garbage collection is under private contract, with bonded contractors collecting an average of 300 tons of garbage monthly, with four motor trucks as equipment, at a cost of $1083.33 per month to the city, which has a population of 25,817.

The streets are cleaned by a motor pick-up sweeper and a 2½-ton truck. The business section of the city is cleaned daily and the outlying streets three times each week. Previous to the purchase of the pick-up sweeper, using the old hand and broom method, it cost the city $11.51 per mile to clean the streets and many were not cleaned oftener than once a month, with the business section cleaned once a week. Since using the sweeper, the cost has been cut to $1 per mile.

Rubbish collection is done during the first seven days of each month. The schedule is published in the local paper the week previous to collection, and rubbish is collected by one truck and five men, the collection being a house-to-house pick-up. The rubbish is placed at the curb on the day designated, so that it is not necessary for the men to enter the premises.

The collection of garbage, cleaning of streets and picking up of rubbish is under the direction of the Supervisor of Sanitation, who, in turn, is responsible to the Health Commissioner.

LEO P. FITZGERALD, M. D.
Health Commissioner.

Nine Years' Costs of Garbage Collection in Kenosha

SINCE 1922, Kenosha, Wis., has disposed of its garbage and refuse by filling in along the lake front of Lake Michigan. Prior to this time a breakwater was constructed, extending from 900 to 1,000 feet into the lake from the shore line. This breakwater consists of a double row of tight piling filled with stone between the lines of the piles, and prevents garbage and débris from floating out into the lake and being deposited along the shore line.

The total garbage collection and disposal cost for the years 1922 to 1930, inclusive, was $430,115.17. The actual value of the land reclaimed by this method of disposal is estimated at $280,100. By offsetting this amount against the garbage collection cost, it reduces collection costs to $150,015.17, covering a period of 9 years, or an average annual cost of $16,683.35. The average annual population of the city during this period was about 48,000, so that the average cost of garbage disposal for this period is 34.7 cents per capita per year.

Garbage, refuse and ashes are collected weekly in the residence districts and twice a week from hotels, restaurants and such stores as accumulate a considerable amount of refuse. The equipment used consists of five 2½-ton trucks, two 1½-ton trucks and one 3-ton truck, two 3½-ton trailers and one 4½-ton trailer, one small roadster and six horses.

A total of 16,254 loads, or 51,636 cubic yards, or 33,663 tons, of garbage, ashes and refuse, were collected during 1930. The average length of haul is 2¾ miles, and three trips per week were made to the City Poor Farm, where 40 hogs were fed with garbage delivered to the Farm by the Department. The cost of collection, exclusive of interest and depreciation, was $54,201.69.

P. J. HURTGEN,
Director of Public Works.

CRASH!

3-FOLD principle of fire alarm transmission protects against broken boxes, pedestals and test posts

Skidding and careening motor vehicles on icy streets or in the hands of intoxicated and inexperienced drivers are each day knocking down fire alarm boxes, pedestals, and test posts. Even a backing vehicle in the hands of a careful driver is likely to add to the toll of accidents, which might break from one to several fire alarm circuits and put out of service, temporarily, scores of fire alarm boxes. Before such damage can be repaired, there is always the likelihood of an alarm for a serious fire being lost.

The new 3-FOLD principle of fire alarm transmission being introduced with the new Gamewell 1931 Model PEERLESS Fire Alarm Box, safeguards against such accidents. Whenever a box (other than one involved in a vehicle accident) is operated on a broken circuit, it is possible for the alarm to be received at the central office over whichever side of the circuit remains intact.

Fire Chiefs, Superintendents of Fire Alarm and other city officials who have a voice in the purchase of fire alarm systems, owe it to themselves and to the citizens of their city whose lives and property it is the officials' duty to protect, to investigate the new 3-FOLD principle of alarm transmission. More complete information will be sent to you upon request.

GAMEWELL

THE GAMEWELL COMPANY
NEWTON, MASSACHUSETTS
"A Box a Block"

FIRE—SAFETY—TRAFFIC

Items for Departments of Public Safety

Fire Schools Active

HEAT having no terrors for fire fighters, the advent of summer finds vigorous activity in courses of instruction for firemen, in many quarters. It is increasingly realized that the work of fire departments is greatly different from what a former generation knew, and that it calls for much special knowledge and trained skill. As stated by the Industrial Commission of Wisconsin: "In this onward march the fire school can help greatly. It acts as a meeting point to compare means and methods. Expert drill masters lead in movements and evolutions, trained instructors teach methods of life saving, resuscitation and first aid, and experienced practical men discuss machinery, tools and modern methods. . . . It is important that bright, active, resourceful men be selected to attend who can get most out of a short course and are best able to instruct and train the members at home."

In New York State three types of instruction are being carried out this year. The New York State Conference of Mayors and Other Municipal Officials, in cooperation with the state Fire Chiefs' Association, has been conducting training schools for firemen since 1929. Zone fire training schools are in operation this year in 18 cities, and the attendance is expected to exceed last year's enrollment of over 3,000. Instructors for the zone schools are given a week of intensive training; for the current year this took place in Albany, beginning May 11, with an attendance of 24.

In addition to the zone schools and the course for instructors, an institute for fire chiefs will be held this year for the first time, on June 9-11, in connection with the annual meeting of the New York State Fire Chiefs' Association and the Mayors' Conference, at Glens Falls. It was recognized that different problems confront the administration and the men in the ranks, hence the following subjects will be discussed: organization and administration; fire-alarm systems; equipment; fire prevention and building inspection; ventilation; reducing fire hazards in buildings under construction; modern methods of fighting fire; salvage.

In Oklahoma the first of a series of quarterly schools for fire department instructors was held in Oklahoma City, April 20-22; 33 cities were represented by 50 instructors, chiefs and others, as a result of which 919 firemen in these cities will each receive 100 hours of instruction annually until completion of the full course. The school is sponsored by Oklahoma University, Oklahoma Agricultural and Mechanical College, the Oklahoma Municipal League and the State Board of Education, and is under the supervision of the Oklahoma State Firemen's Association.

The Northern Kentucky group of the Kentucky Firemen's Association is holding its first Short Course for Fire Fighters, June 23-26, at Newport. Other courses given in June include the Firemen's Short Course of the New Mexico State Firemen's Association, Clovis, June 3-5; the third annual Kansas Fire College, Topeka, June 8-10; the second Fire College of the Florida State Firemen's Association, at Sebring, Fla., June 10-12; the seventh annual Illinois Fire College, University of Illinois, Champaign-Urbana, June 23-26; and the Wisconsin Short Course, University of Wisconsin, Madison, June 23-26. Other states, among them West Virginia, Michigan, Montana and Colorado, will follow suit later in the summer.

Accident Facts

THE National Safety Council, from its Chicago office at 20 North Wacker Drive, has just published the 1931 edition of its annual booklet of the above title, bringing up through 1930, so far as possible, reliable information regarding accidental deaths and injuries in public places, homes and industries. It states at the outset:

"Approximately 99,000 people were killed by accidents in the United States during 1930, the largest number in our history. The increase over 1929 is not as large, however, as in most other recent years. Calculations based on U. S. Census Bureau figures indicate 98,258 deaths from accidental causes in 1929, so the 1930 figure represents an increase of less than 800. Not since 1921, when there was an actual decrease from the previous year, has the annual increase been as small as that now believed to have occurred in 1930.

"The increase, in fact, was less than that which would be anticipated from our increasing population, resulting in a decline in the death rate per 100,000 population from 80.9 in 1929 to 80.4 in 1930. But should this rate prove to be correct when final figures are known it will still be the highest rate, with the exception of 1929, since the war years." We continue to lead the world in the death rate from accidents.

Of the total of 99,000 deaths, one-third were from automobile accidents, an increase of nearly 6 per cent over the 1929 figure. In addition to the 33,000 deaths, it is roughly estimated that about a million non-fatal injuries occurred, and that personal injuries and property damage cost about $900,000,000. The death rate from automobiles continues to rise while that from other accidental causes declines. Most of the states showed increases in the automobile death rate from 1929 to 1930; but substantial decreases are reported for Rhode Island, Montana, Connecticut and New Hampshire.

The automobile death rate, based on the place of occurrence of the accident, is less in urban than in rural areas; and despite the increase in motor-vehicle deaths for the entire nation, a group of 110 cities, chiefly over 100,000 in population, showed a decrease of 0.3 per cent.

The increase in automobile deaths occurs chiefly in connection with private cars, as commercial vehicles, busses and taxicabs, as classes, all show steady improvement in accident records.

Public accidents, other than those involving motor vehicles, are estimated to have caused about 20,000 deaths and 2,500,000 non-fatal injuries. Railroad accidents showed a notable decrease, with the number of deaths the smallest since 1888. There was also a large decline in collisions of automobiles with railroad trains at grade crossings. There were 529 aviation fatalities in 1930 as against 628 in 1929. The report says: "From the last six months of 1928 to the same period of 1930 the fatality rate per million miles flown declined 87.5 per cent in scheduled air transport operations. In other flying, on the contrary, there was an actual increase of 7 per cent."

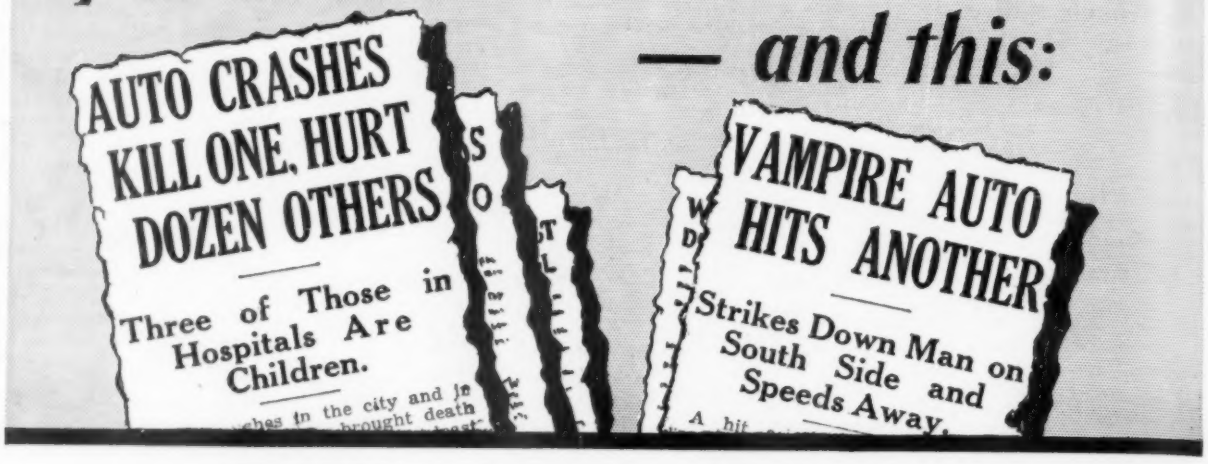
A "Self-Service" Traffic Light

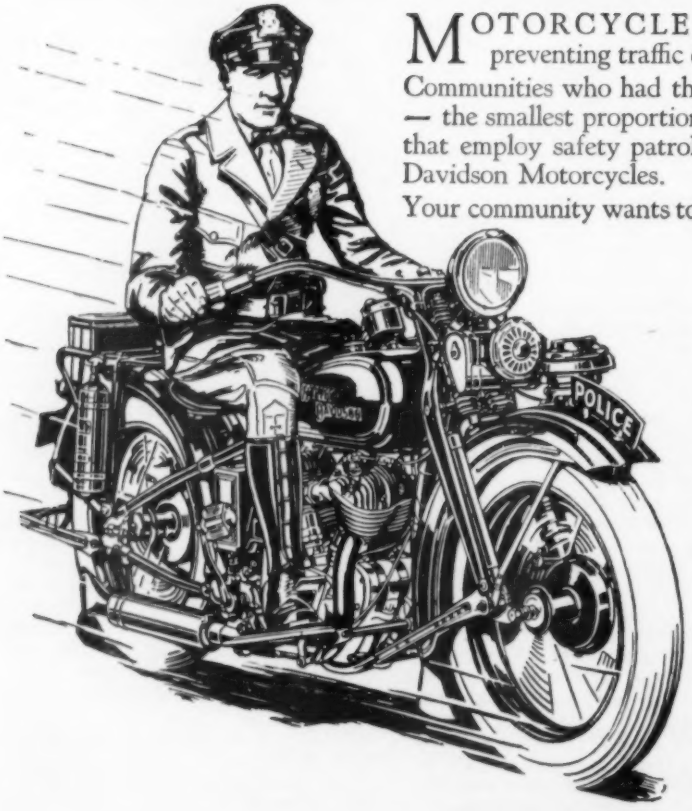
THE "self-service" idea, born in the cafeteria and the grocery store, has spread even to traffic lights, with the installation recently of a pedestrian-operated traffic-control light at the intersection of Newark and Fairmont Avenues, in Elizabeth, N. J., one of the first such signals in the country.

Newark Avenue is a thoroughfare much used by motor-vehicle traffic, and the signal at this intersection is a flashing light which normally gives the right-of-way to vehicular traffic. When a pedestrian desires to cross Newark Avenue, however, he has simply to press a button mounted in a post on the curb, and the light shows red, stopping the traffic for a sufficient length of time to insure a safe crossing.

Officials are predicting a widespread growth in the use of signals of this type, as they are especially suited for corners where vehicular traffic flows in a steady stream but where pedestrian traffic is not heavy enough to warrant regular stoppage of the motor cars. At such intersections a pedestrian-controlled—or "self-service"—light does away with unnecessary stopping of motor traffic, with a consequent saving of time, fuel, etc. This should particularly appeal to motorists. Attention is called to the fact that "cafeteria" signals for motor-vehicle operation have been used for some time.

SUREST PREVENTION
against this:


AUTO CRASHES KILL ONE, HURT DOZEN OTHERS
Three of Those in Hospitals Are Children.
— and this:
VAMPIRE AUTO HITS ANOTHER
Strikes Down Man on South Side and Speeds Away.



MOTORCYCLE officers have proved the best means of preventing traffic deaths.

Communities who had the best records for traffic safety in 1930 — the smallest proportion of deaths to population — were those that employ safety patrols of mounted policemen riding Harley-Davidson Motorcycles.

Your community wants to be in the fore-front of the battle against auto mortalities. Something must be done to make streets and highways safer for our citizens. The automobile killed 32,500 people in 1930 — it has caused more deaths in the past eighteen months than the A. E. F. lost during the World War.

Police motorcycles are your surest weapon of defense for your citizens. And the Harley-Davidson is pre-eminently the Police Motorcycle — more are in police service than all other makes combined.

"Bloodiest Page in American History"

— that's the title of a folder you will find most interesting — full of facts that every city official needs. Write for a free copy, and Police Booklet, today.

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The Police Motorcycle

EARL M. MATHEWS
Police Chief
St. Joseph, Mo.
(Appointed 1929)

A. H. COOLEY
Fire Chief
Santa Barbara, Calif.
(Appointed 1920)

J. E. SUGGS
Police Chief
El Dorado Springs, Ark.
(Appointed 1928)

C. S. DAILEY
Fire Chief
Bemidji, Mich.
(Appointed 1929)

JOHN B. FALVEY
Fire Chief
Terre Haute, Ind.
(Appointed 1930)

Who's Who in Public Safety

The 40th of a Series of Portraits of Fire and Police Chiefs Which Has Appeared Monthly Since January, 1928

GEORGE G. BALLARD
Police Chief
Newcastle, Ind.
(Appointed 1929)

W. H. SMITH
Fire Chief
Louisiana, Mo.
(Appointed 1928)

HARRY L. MOORE
Police Chief
Frankfort, Ind.
(Appointed 1930)

MACK HOSTELLER
Fire Chief
Mitchell, Ind.
(Appointed 1929)

M. B. BRIDGES
Police Chief
Neosho, Mo.
(Appointed 1921)

EDWIN H. MILLER
Fire Chief
Brownstown, Ind.
(Appointed 1925)

JOSEPH INTER
Police Chief
Washington, Mo.
(Appointed 1926)

E. L. JACKSON
Fire Chief
Liberty, Mo.
(Appointed 1925)

CHARLES B. MOON
Fire Chief
Warsaw, Ind.
(Appointed 1906)

Speedy communication needed to catch today's crooks, say police

"THE automobile and other modern agencies now used by criminals demand the utmost speed and accuracy in the dissemination of police information," states the Police Commissioner of Boston, Mass. "To allow criminals to employ new inventions in the commission of crime without combating them with up-to-date methods of communication is false economy."

That is why the police departments of Boston and hundreds of other cities now use Teletype ...a remarkable machine which sends typewriting over telephone or police alarm system wires at a speed of 60 words per minute. Every letter or figure typed on the sending machine at headquarters is instantaneously reproduced by the desired receiving machines. These record their messages automatically and therefore require no attendants.

Installations can be arranged so that a description, for example, may be flashed to any one station, to any group of stations, or simultaneously to *all* stations. Both the sending and receiving machines make a typewritten copy of the message being sent, thus doing away with misunderstandings and definitely fixing responsibility.

Teletypewriter service will pay for itself many times over, not only by apprehending more criminals but by insuring against waste of time and mistakes in the handling of routine police communication. For further information consult your local telephone company or write the Teletype Corporation, 1400 Wrightwood Ave., Chicago.

Sgt Moynihan, of the Worcester, Mass., police department, reading a Teletyped message

TELETYPE
SUBSIDIARY OF
Western Electric Company
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TELETYPE IS USED BY THE POLICE DEPARTMENTS OF

Baltimore, Md.	Detroit, Mich.	Pittsburgh, Pa.
Boston, Mass.	Los Angeles, Calif.	Portland, Ore.
Chicago, Ill.	Louisville, Ky.	San Francisco, Calif.
Cincinnati, Ohio	New York City, N.Y.	St. Louis, Mo.
Cleveland, Ohio	Philadelphia, Pa.	Washington, D. C.

and hundreds of other cities

TELETYPEWRITER SERVICE

JUNE, 1931

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The American City

470 Fourth Avenue
New York

50 Cents, $4 a Year

Teletypewriter Aids in Police Work

Last Year Has Seen Increase in Number of Alarm Systems—Crime-Thwarting Networks Surround Many Large Cities

By R. FRANK HARREL

As those engaged in criminal activities make increasing use of the automobile as a tool in accomplishing their exploits—a tool which makes it possible for them to commit their crimes and escape the vigilance of local police agencies by fleeing into other police jurisdictions—the need of widespread alarm systems becomes more and more apparent to administrators of city, county and state police units. That the teletypewriter instrument,

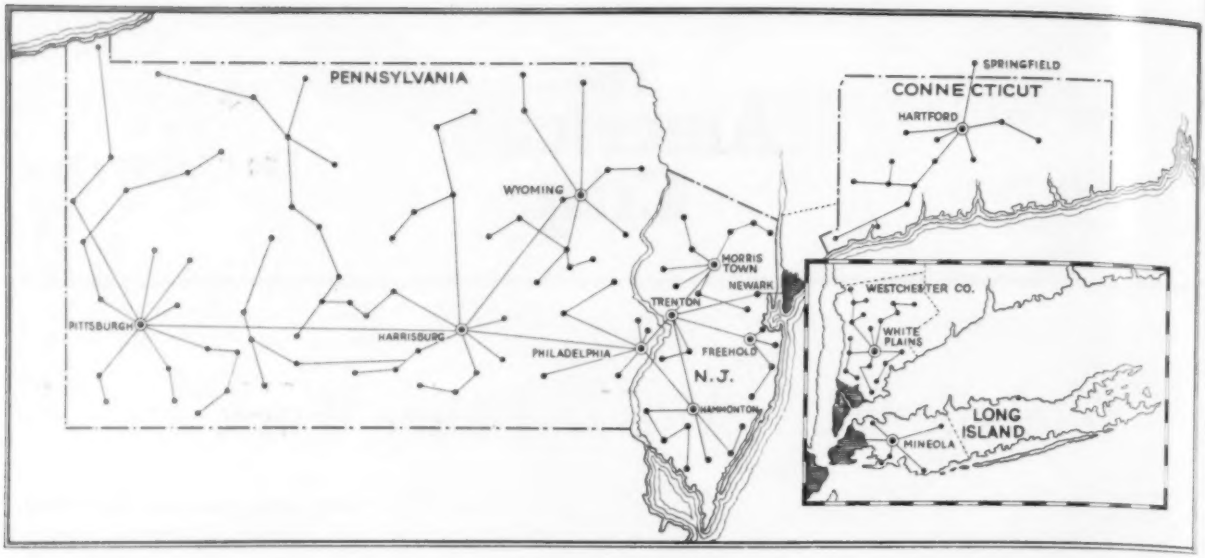
a machine which transmits written words just as the telephone transmits spoken ones, has met with general favor as a means of competing with automotive crime, is indicated by the growth in the number of systems used by various police units in the United States during the past year. In 1930, seven cities, counties and states installed widespread teletypewriter alarm systems to aid them in police administration by uniting scattered precincts or zones into one cooperating whole.

Teletypewriter Service and Its Advantages

The usual police teletypewriter installation consists of centrally located dispatching equipment connected to any number of distant receiving machines by direct telephone circuits. Messages to be transmitted are set up on the sending machine, which is operated by a keyboard similar to that of the ordinary typewriter. These messages appear simultaneously on the distant machine, or machines, in clearly legible type, just as they are written.

Some of the general advantages which teletypewriter service has demonstrated in comparison with other forms of communication used by police are: the simultaneous transmission of detailed descriptions, data and instructions to a number of locations, as opposed to the necessity for individual communication with each location and the subsequent loss of valuable time; the reliable transmission of messages in printed form, eliminating misunderstanding or garbling due to messages passing through intermediaries; the introduction of coordinated police activities as the result of the operating flexibility of the service; the definite fixing of responsibility through the printed record; reporting back to headquarters the solution of crimes or recovery of property; and the advantage of secrecy, so that the criminal cannot avail himself of information pertaining to police operation.

A PENNSYLVANIA STATE TROOPER
flashes an alarm over the state-wide police alarm system



THE TELETYPEWRITER NETWORK GROWS

Communication systems of important metropolitan centers of the East are shown. All except two systems—those of Connecticut and Westchester County, N. Y.—are interconnected, making it possible for alarms to be broadcast over wide areas. The inset shows the Westchester and Nassau networks in detail; the shaded portion represents New York City, which is completely policed by teletypewriter

The New York City Network

Several of the installations made during the past year or so were contiguous to other systems already in service, so that cooperation between the various police agencies makes possible the speedy dissemination of news concerning criminal activities over large areas. The largest area covered by teletypewriter network in which the units are interconnected by teletypewriter, or may be interconnected by long-distance telephone as desired, is that patrolled by the various systems in and around New York City, a territory extending from the eastern border of Connecticut to the western border of Pennsylvania. The teletypewriter systems in this network, which are operated by the state of Pennsylvania, the state of New Jersey, Essex County, N. J., New York City, Westchester County, N. Y., Nassau County, Long Island, the State Police and various municipalities in Connecticut, compose a network of written communication that knits together important police agencies patrolling all highways radiating from the important cities of New York, Philadelphia, Trenton, Hartford, Atlantic City, Pittsburgh, Harrisburg and Newark.

Under the provisions of the Webb-Allen Bill passed by the last New York State Legislature and signed in April by Governor Roosevelt, a teletypewriter system for the New York State Police will be installed during the summer. Completion of this system will mean an extension of the protective network from the southern border of New Jersey to the Canadian international boundary line.

New York City police, having obtained information concerning the westward flight of criminals from the city, are able at once to broadcast that information by teletypewriter to all police precincts in the city and through its connection with the New Jersey system to the State Police headquarters at Trenton. Here, if the information is of sufficient importance, it may be relayed to all points connected with the New Jersey State Police system and to the Philadelphia zone headquarters of the Pennsylvania State Police teletypewriter system. If the fugitive has evaded police on his flight through New Jersey, he still has another obstacle to surmount, for the information concerning his crime may be dispatched from Philadelphia by teletypewriter to Harrisburg, headquarters of the Pennsylvania system, and from there to 100 locations throughout the state.

Teletypewriter systems to the north and east of New York City, while they are not tied-in directly with the alarm system of the metropolis, offer effective obstacles to the fugitive taking that direction. If the case is of sufficient importance, messages telephoned to White Plains, headquarters of the Westchester County system, and to any point in the Connecticut system, may be dispatched on the two systems, so that within a few minutes after the criminal has left the boundaries of New York City, officers in all parts of Westchester County and Connecticut will be in possession of the facts concerning his crime—what direction he took, a description of his person and the automobile in which he is traveling, and any suggestions that New York City officers may have concerning his whereabouts. The New York City system is tied directly to the headquarters for the Nassau County, Long Island, system, so that information dispatched on either system is received simultaneously in the headquarters of the other.

New York City police are no more fortunate than officers in other centers in the area mentioned, as alarms may be broadcast with equal speed and effectiveness from Philadelphia, Pittsburgh, Trenton, Hartford and other principal cities in the various systems, to be picked up by adjacent police units and rebroadcast just as messages from New York City are received and distributed by the police units surrounding the city.

The Pennsylvania System

The Pennsylvania State Police system is the largest in the country from the standpoint of the area covered. The details of its operation serve to illustrate the operation of the other systems, state, county and municipal.

The Pennsylvania system comprises 110 machines op-

erating continuously and connecting 95 cities and 100 locations within the state. The state is divided into four zones with a central headquarters at Harrisburg, and zone headquarters at Philadelphia, Pittsburgh and Wyoming. The equipment at each one of these locations consists of two combined sending and receiving teletypewriter instruments of the page type and associated switching equipment, with one additional receiving-only instrument in each zone headquarters, and three additional receivers at state headquarters. All other locations throughout the state are equipped with receiving-only apparatus.

Nine main channels radiate from Harrisburg to various parts of the state in order that messages may be sent simultaneously to all locations on the system, or, if desired, to locations on any one or more of these main channels which may be selected. Branch channels radiate from each of the zone headquarters so that a zone headquarters point may send to the remaining locations in its zone. The channels between zone headquarters and central headquarters are arranged for simultaneous transmission in both directions.

A police officer in a town in which a crime has been committed telephones to his zone headquarters the details of the crime. Zone headquarters immediately dispatches by means of teletypewriter the information to all points within the zone and to central headquarters at Harrisburg. The information, upon receipt at Harrisburg, is edited and, if of sufficient importance, is transmitted over the other channels or such channels as may be selected to distant parts of the state. Matters of general interest emanating from the State Police Department at Harrisburg can be sent from that point to all the other points on the system. A majority of installations in connection with this system have been made in municipal police headquarters, rendering state-wide crime news as readily available to local police as to the State Police.

In New Jersey and Connecticut

The New Jersey state system operates in a like manner, except that there is a more elaborate switching system at state headquarters at Trenton which permits the operator there to "seize" all circuits radiating from zone headquarters when there is an alarm of sufficient importance, or to interconnect at will any of the zone headquarters at Hammonton, Freehold, Newark and Morristown.

There are two systems in the state of Connecticut, that used by the various municipalities and the State Police system. In the system used by the municipalities, a crime reported in any one of them is broadcast simultaneously to other police headquarters, as there are both sending and receiving machines at each point. In the State Police system there are sending and receiving machines at headquarters at Hartford and in the various barracks located throughout the state, as well as the State Motor Vehicle Department at Hartford.

The various county systems have sending apparatus at system headquarters and receiving-only machines in the outlying districts. Alarms from these outlying districts are telephoned to the various headquarters and broadcast to the entire systems.

The New York City system, consisting of 136 machines, provides for two-way teletypewriter service between general Police Headquarters in Manhattan and the four outlying borough headquarters in Brooklyn, Queens, Richmond and The Bronx, and one-way teletypewriter service from each borough to their associated precincts.

The proposed New York State Police teletypewriter system will provide a communication network to coordinate all law-enforcement agencies in the state—municipal, county and state. The state will be divided into six districts, generally coextensive with the administrative districts of the State Police. District headquarters will be located at State Police barracks at Hawthorne, Malone, Oneida, Batavia and Sidney, State Police headquarters

POLICE TELETYPEWRITER HEADQUARTERS, PENNSYLVANIA STATE CAPITOL BUILDING

at Albany serving as both state and district headquarters, a control point and clearing-house for all information.

Circuits will connect Albany headquarters, where sending and receiving machines and associated switching equipment are to be installed, with similar equipment in each of the district control points, as well as with various district points in the Albany district, including State Police barracks at Troy. Branch channels will radiate from each of the district control points to district points. In some of these districts points—the more important cities and towns—both receiving and sending machines will be located, and in others receiving-only machines. Operation of the system will be similar to that of the Pennsylvania State Police system, except that many of the district points will send as well as receive information by teletypewriter.

Information of importance filed at any point in the state will be available not only to State Police authorities but to local officers as well, for many of the district machines are located in local municipal police headquarters. There will be connections with other systems in the state—at White Plains with the Westchester County system, at New York with the New York City system, at Mineola, L. I., with the Nassau County system, at Albany with the Albany police system, and at Buffalo with the municipal police teletypewriter system.

Some Thrilling Instances of the System's Efficiency

Examples of the efficiency of these teletypewriter systems in police work are numerous. Information dispatched over them has led to the capture of dangerous criminals who otherwise might have escaped, police officers say; in Westchester County, N. Y., during a six months' period during which a record was kept of automobiles stolen and recovered, police reported that 45 per cent of the cars taken were recovered within 24 hours; lost persons and over-romantic youngsters who have taken leave of fond parents have been found and brought back by police receiving their descriptions by wire, and in all of the police jurisdictions executives report a remarkable betterment of *esprit de corps*, as the teletypewriter systems have kept patrolmen more alert and in closer touch with headquarters.

On February 1, 1931, four men broke into a jewelry shop at Beacon, N. Y. They were surprised by local officers, but three escaped in an automobile, taking the road to New York. Information was immediately telephoned to the headquarters of the Westchester County police teletypewriter system and to New York City Police Headquarters. The robbers were sighted once on their mad flight southward, and a new alarm was broadcast concerning their movement. By the time they reached Yonkers, practically every peace officer in the county was on the lookout for them, having been warned by teletypewriter messages relayed by telephone to call-boxes. Charles Smith, Westchester County Parkways policeman, first encountered them at Yonkers. He waved them to stop, but they answered by opening fire with their revolvers.

Smith gave chase on his motorcycle, and forced the fleeing automobile into a ditch. In a hand-to-hand encounter he collared one of the trio, but the other two eluded him and commandeered a taxicab, starting out anew for New York City. The taxicab was halted finally by New York City Police, who riddled the tonneau with bullets from their revolvers, killing both bandits.

The use of the teletypewriter in police work is not confined to the eastern seaboard, as 27 states, counties and cities are now using the systems in police administration. Along the Pacific Coast there are Los Angeles, Los Angeles County, San Francisco and Portland, Ore. In the Mid-West there ten cities, Cincinnati, Cleveland, Detroit, Minneapolis, Omaha, Kansas City, St. Louis, and the Chicago, Winnetka and Evanston group, and in the eastern and Atlantic states, Boston and Worcester, Buffalo, Pittsburgh, Baltimore, and the District of Columbia, in addition to the state and county systems already mentioned, all have police teletypewriter systems.

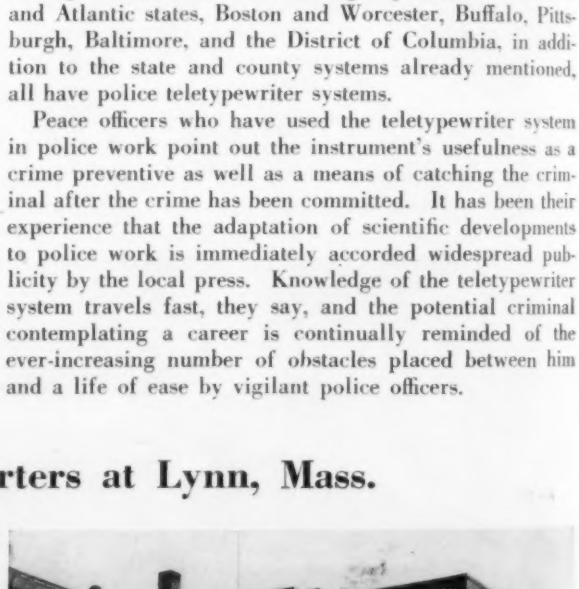
Peace officers who have used the teletypewriter system in police work point out the instrument's usefulness as a crime preventive as well as a means of catching the criminal after the crime has been committed. It has been their experience that the adaptation of scientific developments to police work is immediately accorded widespread publicity by the local press. Knowledge of the teletypewriter system travels fast, they say, and the potential criminal contemplating a career is continually reminded of the ever-increasing number of obstacles placed between him and a life of ease by vigilant police officers.

New Police Headquarters at Lynn, Mass.

THE city of Lynn, Mass., recently dedicated a new police headquarters building. Mayor J. Fred Manning and Chief of Police James H. Broad acted as hosts at a dinner which was attended by city officials and Police Chiefs from Salem, Revere, Peabody, Saugus, Nahant, Swampscott, and Marblehead. Congressman William P. Connery was toastmaster and among the speakers were Mayor Manning; Mayor George J. Bates, of Salem; Timothy J. Curtin, President of the Lynn City Council; and Emmet Casey, architect of the building.

The new station establishes a precedent in providing separate detention rooms for juvenile offenders—one for boys and one for girls. These quarters were provided upon recommendation of Judge Ralph W. Reeve, of the Lynn District Court.

The building contains offices, guard room, kitchenette, cell block, liquor storage room, lost property room, booking room, gymnasium, shower baths and lavatories, and a target range and reporters' room in the basement. It is a brick structure.



What Losses Can Be Eliminated Through Better Design and Operation of a Water-Works System?

By FRANK C. JORDAN*
Secretary, Indianapolis Water Company,
Indianapolis, Ind.

IT is perfectly true that the avoidable losses in a water-works plant start with the original design of the plant, and most of the losses in existing plants are partly by reason of faulty design and partly by reason of poor operation. It is highly desirable that every water utility be thoroughly studied at least once each year by a competent water-works engineer and, after that, the management should maintain a regular check of all construction and operation to see that they conform to recognized standards of service and economy. Such a procedure should be of great benefit to the community as well as to the water-plant owners.

Possible Savings in Filtration Plants

The thorough mixing of coagulants before coagulation is a point where a very real saving can be made. At three plants there was an average reduction of 31 per cent in the amount of sulphate of alumina used following the installation of mixing equipment. Prechlorination and also the introduction of ammonia result in improvements in the quality of water delivered from the purification plant as well as a saving in the operating expenses. Excessive washing of filters is an excellent example of an avoidable water-works loss.

In the design of the Providence, R. I., filter plant, because of a favorable site, a coagulation basin, capable of several days storage, was built instead of a smaller basin of the customary eight-hour storage capacity. Because of the size of this basin, it does not have to be cleaned during the winter season and thus could be built without a roof. The general construction was very similar to that of any impounding reservoir and therefore its cost was not in excess of the common type of concrete coagulation basin with a roof. As a result of the increased retention period for coagulation, it has been possible to cut the alum dose to a minimum. It is estimated that only about one-third as much alum is required as would be needed in a basin of ordinary size. In a plant treating an average of 25,000,000 gallons daily, this reduction in alum dose from 5,000 to 1,700 pounds per day amounts to a saving of about $12,000 per year.

Another possible saving is the use of a single controller for three or four filter beds.

Savings Through the Intelligent Design of Wells

A great many water companies, as well as municipalities, use wells as their only source of supply, additional wells being drilled and put into service as the demands of the system grow beyond the capacity of the existing wells. In many properties, wells have been abandoned or never used which when properly tested for capacity compared favorably with the other wells then in use. These wells were abandoned because the original tests showed no capacity or because the flow from them decreases after a number of years of pumping. As a rule, it is much cheaper to clean or re-test such wells rather than drill new ones.

In numerous instances wells are found with the pumping equipment a considerable distance from the bottom of the well. By having the pump suction down as low as possible, the capacity of the well is usually increased.

Possible Savings in the Pumping Station and Boiler Plant

The largest single loss in the average water plant is in its pumping costs, which in many cases are higher than necessary because of the use of improper equipment or a decrease in the efficiency of the existing equipment. In some cases improperly designed pumping equipment is installed, which puts an added burden of operating cost on the plant budget. This is passed to the customer, to the ultimate disadvantage of the community as a whole.

In one community a saving of 50 per cent in pumpage costs could easily be made by changing from steam to electrical power, which is available from a hydraulic development at a very low cost. A great saving could be made by putting in better steam equipment and operating it more effectively. It is a regrettable fact, however, that political factors prevent the consummation of much-needed economy in this municipal plant.

A substantial saving has been effected in some plants through the installation of an oil- and waste-saving machine and oil filter. These are ordinary pumping-station economies, but effect a satisfactory reduction in operating expenses. In one plant the installation of three new water tube boilers to burn powdered coal, each boiler being equipped with its individual pulverizer, produced excellent results, increasing the station duty from 18 to 20 per cent.

The purchase of coal that will give the greatest number of heat units per dollar is very important, together with

* Acknowledgment is herewith made of the receipt of valuable information from the following well-known water-works authorities: George W. Biggs, Jr., Chief Engineer, American Water Works and Electric Co., New York; Paul Hansen, Consulting Engineer, Pearse, Greeley & Hansen, Chicago; W. C. Hawley, Chief Engineer and General Superintendent, Pennsylvania Water Co., Wilkinsburg, Pa.; V. Bernard Siems, Executive Vice-President and Chief Engineer, National Water Works Corporation, New York; J. E. Gibson, Manager and Engineer, Water Department, Charleston, S. C.; H. O. Garman, Consulting Engineer, Indianapolis; Arthur E. Gorman, The Pardee Engineering Co., Inc., Chicago; C. M. Osborn, City Manager, Wilmette, Ill.; Charles F. Ruff, Consulting Engineer with Malcolm Pirnie, New York; George W. Pracy, Superintendent, City Distribution Division, Water Department, San Francisco; C. M. Saville, Manager and Chief Engineer, the Water Bureau, Hartford, Conn.; S. M. Van Loan, Deputy Chief, Bureau of Water, Philadelphia; Charles Brossman, Consulting Engineer, Indianapolis, and several men of the Indianapolis Water Co.

the utilization of that coal in accordance with the best operating standards. Many small water-works plants are operating boilers which are only giving 50 or 60 per cent efficiency and sometimes lower. This is wasteful and without reason. These efficiencies should be brought up to around 65 or 70 per cent by hand firing, or even greater if stoker equipment is used. Station logs should be kept showing coal consumption in relation to water evaporated in the boilers, so that the maximum evaporation of water into steam can be obtained.

All such inefficiencies could be eliminated through proper engineering, but much can be done through an aroused interest on the part of the operators of the boiler plant and pumping station. Steam plants should be equipped with all gages necessary to trace the heat in the coal all the way to the water delivered. The men should keep records not only of pressures and quantities, but of pounds of coal and kilowatts per million gallons pumped, tons of coal per thousand pounds of steam, etc.

In one plant a large number of gages were installed and the engineer was instructed to plot a daily curve showing the pounds of coal per kilowatt-hour and the kilowatts per million gallons of water pumped. About a week later, no curve having been put on the bulletin board, he was asked about it. He admitted he was keeping the curve, but that it looked so terrible that he was ashamed to put it up. A week later, however, the plotting appeared on the board. For some time there was quite a variation up and down in the amount of coal per kilowatt and the other factors, but gradually the operating force managed to smooth the curve to a straight line within reasonable limits.

Losses Due to Using Centrifugal Pumps with Constant-Speed Motors

A common source of loss in pumping stations is caused by the use of centrifugal pumps with constant-speed motors. In one plant the pump was designed for 175-foot head, but commonly pumped against a head of 125 feet. The manager of this plant, having learned from the curves that the pump was most efficient at 175 feet, had the engineer keep the discharge valve throttled down so that the gage on the pump read 175 feet, thus, as he thought, securing the highest efficiency. The fact that 50 feet were thrown away at the discharge valve never seemed to strike him as a a great loss. This pump was delivering water to a tank, and the obvious solution was to run with the valve always wide open, although under this condition the pump would not have as high kilowatt-per-water-horsepower efficiency, it would pump more water for the current consumed, which, after all, was what was desired.

Where centrifugal pumps deliver direct to a distribution system, some storage should always be provided, so that the pumps can run with the valves wide open. When a centrifugal pump is used in a situation where the head varies considerably, a variable-speed motor should always be used. With a constant-speed motor, if a pump is made to deliver the same quantity under half the head by throttling the discharge valve, the pump uses the same horsepower and the same electric consumption as with a full head. The efficiency under this condition is just half the efficiency at the higher head. With a variable-speed motor, the pump can be slowed down to a point where it delivers the desired quantity of water at the reduced rate with very nearly the same pumping speed as before. Under this condition, only half the horsepower is required. The efficiency of the variable-speed motor will fall off in proportion to its speed. Under this condition it will be perhaps 75 per cent as efficient as before. This reduced efficiency, however, applies only to the power taken by the pump, which is half the original power, and consequently, the kilowatts per water efficiency would be considerably more with the constant-speed motor.

Some distribution systems are carrying unnecessarily high pressures, thereby entailing avoidable losses. In one case the average pressure on a distribution system was between 100 and 125 pounds, the pumping expense $25,000 per year, and the unaccounted-for water approximately $10,000 per year. A reduction of 25 per cent in the pressure resulted in a leakage reduction of 25 per cent and a saving of over $2,000 per year.

Economies in the Pipe-Laying Department

Labor-saving devices, such as pneumatic tools for cutting pavements, rock, etc., and for tapping backfill in trenches, are necessary to avoid the losses of hand labor. There are other labor-saving devices, such as small excavators, which do the work better, quicker and at less expense than if done by hand labor.

The use of a lead substitute results in a great economy. One water-works company has found that the use of Leadite for joint material in cast iron mains has resulted in marked economy, not only in original costs, but in leakage. Tests of mains laid with Leadite have shown less than 5 per cent of the usual allowable leakage for lead joints. Other cities have felt the use of lead joints in distribution pipe to cause an avoidable loss, since they have found that better joints can be made with ordinary portland cement. This is mixed very dry and calked into the bell in the same manner as lead. On some jobs, it was found that the saving ran as much as $100 per thousand feet of 8-inch pipe. Cement joints of this type have been used with satisfaction in St. Petersburg and West Palm Beach, Fla., Des Moines, Iowa, and San Antonio, Texas.

Savings in the Installation of Service Lines

The use of mechanical couplings for lead pipe not only has resulted in the reduced cost per service, but has, at the same time, reduced leakage. One water company does not permit the use of wiped joints, its experience being that the great majority of service-line leaks are at wiped joints, whereas there are seldom, if ever, any leaks from mechanical couplings. This same company is now using copper tubing for service lines and is finding it considerably less expensive than the heavy lead and more satisfactory in every way.

Unaccounted-for Water

Unaccounted-for water and flat rates go hand in hand as the greatest producers of avoidable water-works losses. The importance of metering cannot be stressed too highly, as there are many cities in which water consumption has been materially reduced through the use of meters. This reduction has been as much as 50 per cent. Metering has also resulted in prolonging the life of certain water-works equipment, particularly filters, for as much as twenty years. At Little Rock, Ark., the pumpage per customer

was reduced from 206,000 gallons per year to 136,000 gallons per year through the installation of meters.

Leakage is common to all systems. Any city which has a pumped supply should meter all consumers and know definitely in each period the amount of unaccounted-for water. Many leaks may be found by the water company's own men, and still further reduction in leakage may be accomplished by having a survey made by one of the standard water-waste survey companies.

The Indianapolis Water Co., through its meter readers, is constantly locating service leaks through the simple process of placing a flashlight or a screw driver against the water line and listening with the ear to the instrument. If they hear a noise on the line, they shut off the stop and waste, and if the noise continues, they know there is a leak on the service line. In this way they can detect even a very small leak, and the saving which they have effected through this inspection has caused a satisfactory reduction in the pumpage.

During the last five or six years the Indianapolis Water Co. has engaged in a metering program under which the public water supply of Indianapolis will be sold by measurement rather than on a flat or guess rate. Approximately 90 per cent of the accounts are now metered and by the end of 1931 the job will be completed. At present the savings are between five and six million gallons of water per day through metering.

The water works at Reading, Pa., keeps two men who do nothing but look for leaks. In four years these men have reduced the water input into the system from 18,000,000 gallons per day to 13,000,000 gallons per day. In addition to the saving in pumping and filtration expenses, the saving of water has removed the necessity of making large expenditures which the city was planning in order to enlarge its pumping and filtering plants. In Hartford, Conn., the entire public water supply, even to public and semi-public property, is metered. According to the last check-up the meters were recording within 15 or 16 per cent of the total pumpage. The unaccounted-for water, included much that was used for fire, sewer and street flushing.

Savings Through Standardizing Meters

The importance of standardizing on a few makes of meters can be quickly understood. At one plant there were some twenty different makes of meters in use, which necessitated keeping twenty different kinds of repair parts, to say nothing of repair parts for the various sizes of each kind. The meters were standardized, using four makes, and then finally three of these were eliminated, leaving one make which, while not necessarily the lowest in first cost, was the one that had given the best and most reliable service with the minimum cost of maintenance, effecting a very real saving. As old meters wore out, they were replaced with new ones of the standard make, thus gradually eliminating the original twenty different kinds. With the elimination of each one, it was possible to cut down the stock of repair parts and so relieve the storekeeper of just that much work.

In Wichita, Kans., a remarkable increase in revenue resulted from the elimination of the avoidable loss through the under-registration of meters. The water supply of Wichita is hard and relatively high in chlorides. It has a very deleterious effect on meters, particularly the intermediate train gears and the measuring disc chambers. By a combination of certain changes in the design and qualities of materials used in the meters, and by more frequent overhauling, the increase in the registration of the meters was little short of remarkable. The campaign to reduce the under-registration of meters was started in the middle of 1923, and by 1929 the earnings per thousand gallons of water pumped had been increased from 12.5 cents per thousand gallons to 17.3 cents per thousand gallons.

Utilization of a Meter Reader's Time

The Indianapolis Water Company has made a study of the utilization of the time of meter readers, whom it prefers to call "water company representatives." These men whose duty it is to read the meters should be schooled to a point where they become better representatives of the company. One of the outstanding avoidable water-works losses is caused by the failure to place on the books of the company all of the money to which the company is entitled. In every city there are certain people who make an effort to get water without contract or payment, and a real representative of the company will detect such cases, to the benefit not only of the company, but of other consumers as well.

Plumbers have a propensity for connecting supposedly dead service lines and furnishing a portion of the supply for an apparently all-metered building, with a consequent loss of revenue to the water department. An efficient water department or water company representative will detect such cases, and the company or department will receive revenue for that service. Meters have a tendency to slow down and shortly thereafter to cease to operate. A real representative will detect the slowing-down and order the meter out for test and necessary repairs. Service lines have a tendency to waste water, and the water company representative should detect that waste, whether it is against the company or against the consumer.

The systematic routing of metered accounts is of special importance in that the elimination of unnecessary steps has a direct bearing upon the morale of the meter readers or water company representatives. A few months ago the Indianapolis Water Co. completed the re-routing of all metered accounts, the re-routing job having taken almost five years. The system is so flexible as to admit of any necessary increase in meter numbers, and no renumbering will be necessary from now on. The time saved through the elimination of unnecessary steps is about equal to the time of two meter readers. Under this plan the men pass every Indianapolis property fronting on or in the proximity of water mains and it is the job of these representatives to see that the Indianapolis Water Co. receives from these properties the revenue to which it is entitled.

The chief meter reader of the Indianapolis Water Co. places the uniforming of meter readers in the front rank of time-saving elements and dividend payers. Since these men were placed in uniform, it is unnecessary for them to wait for the consumer to look them over, size them up and ask them several questions before admitting them to the meter room. The uniform, supplemented by the call, "Water Man" is usually answered "Come in," and a material saving in time is effected.

It is the consensus of opinion that an avoidable water-works loss can be eliminated through the use of up-to-date mechanical billing appliances. The Indianapolis

Water Co. uses four Burroughs duplex utility billing machines. These machines place on the consumer's bill the following information: previous meter reading; date of present meter reading; consumption of water; amount of bill; date payable; amount of arrears; and total amount due. This information is repeated on the cashier's stub and the accounting stub, and the information as given on the accounting stub takes the place of the customer's ledger. Each machine operator prepares from 1,000 to 1,500 completed bills each day.

In Indianapolis we are now using the new metal F-1 automatic Addressograph equipped with automatic suction feed and ribbon print, eliminating the old and rather messy job of re-inking the ink pads.

Several months ago the postcard form of billing was adopted and has been found satisfactory.

Collections

At this time of financial depression, the successful operation of a department of collection becomes of vital importance. It is scarcely necessary to mention that it is of paramount importance to get the maximum amount of business on the books. This takes in accuracy of meters, meter reading, adjusting, intensive work on increasing business through more fire line installations and decreasing the competition from private sources. After this follows the job of converting as much of this business as is possible into actual cash.

The privately operated plant is not so favorably situated in the matter of collection as is the municipally operated plant, where in many cases the water bill is a lien on the property. It is therefore highly important that the privately owned company protect itself through deposits, guarantor and prompt collection. Otherwise the item of bad debts will reach a point where it places an undue burden upon the other patrons of the company. In this day of rapid turnover in rentals and property sold on contracts, there will of necessity be many final bills, and it behooves the water company or department to look well to its collections so that its bad debts be not beyond a reasonable amount.

ACKNOWLEDGMENT.—From a paper presented at the Annual Convention of the Indiana Section, American Water Works Association.

To Curb the Charity Racketeer

"I NEVER saw so many 'chiselers' out collecting for associations and groups of which they are not members, and in which they have no other interest than to get a commission." This is a quotation from a letter written by a prominent advertiser in THE AMERICAN CITY who calls attention to specific instances in New York City, and suggests that public opinion should be aroused to demand better public control over the abuse. Evidence from other cities indicates that the situation is general. There are already, in fact, evidences that "the man on the street" has begun to revolt against charity appeals.

In Minneapolis, in order to conserve the resources of the contributing public and to place a high hurdle across the path of the solicitor for unnecessary or fraudulent projects, the Civic & Commerce Association, through its Committee on Public Solicitations, has provided its 3,500 members with an additional defense against the wily "charity racketeer." Blank forms are supplied to members, with the urgent request that solicitors for all benevolent enterprises be required to fill them out. The members then forward the slips to the Association for checking, or verify the information by telephone.

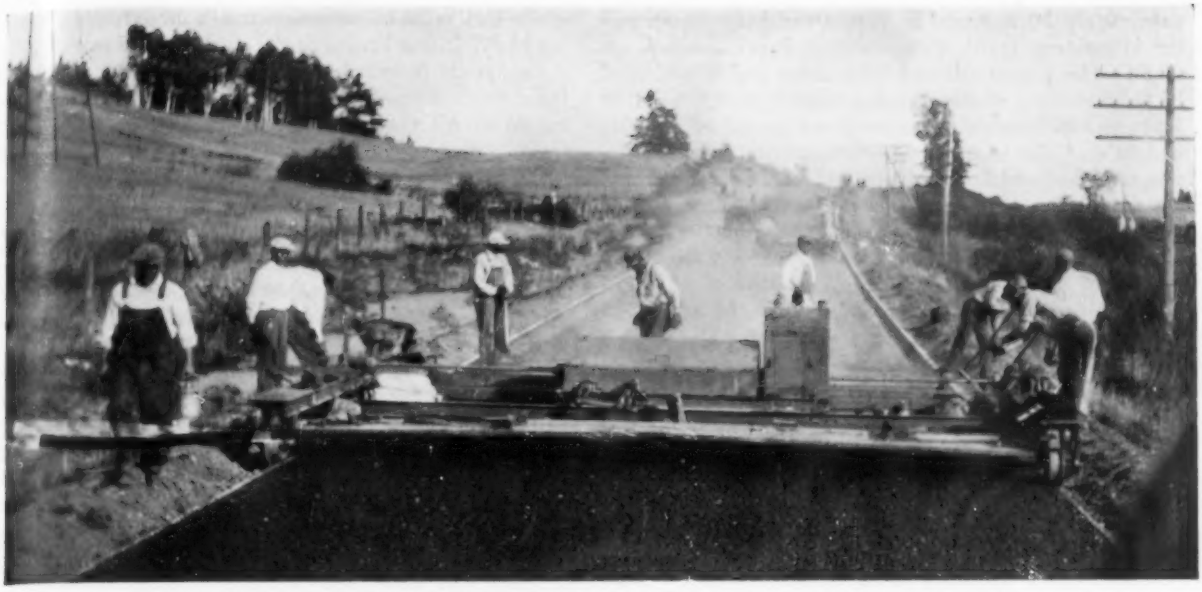
The points covered in the questionnaire are merely the name and address of the organization, the name and address of the solicitor, the use to which donations will be put, and the solicitor's compensation. Simple as these queries are, they yet serve as a stumbling-block in the way of the undesirable money-raising plan. Representatives of legitimate charities have no hesitancy in supplying the data requested. A refusal to supply it is a valid reason for not contributing. Having the record written by the solicitor himself obviates the danger of confusing a fake organization with a bona fide one of similar name.

The use of these forms also gives the man who is solicited a reason for deferring his decision until he can investigate. This system enables the charitably-inclined to give intelligently, so that every dollar donated will do the greatest possible amount of good.

The Minneapolis Civic & Commerce Association furnishes to its members and the public generally a complete service for investigating and endorsing campaigns to raise money for benevolent purposes. The Committee issues confidential bulletins giving information and advice on these matters.

In Grand Rapids, public sentiment recently became public law on the subject. The City Commission passed an ordinance to license and regulate selling or soliciting for charity. This ordinance requires that a written permit be issued by the city manager to any "person, corporation, or society of any kind, nature or description, either charitable, fraternal, or eleemosynary, their agents, representatives or employees" authorizing the selling "of any article or thing," soliciting of funds, securing subscriptions, or otherwise getting money to be used for any so-called charitable purpose. The ordinance further requires that written application must be made for the permit at least ten days in advance of its issuance, and specifies the information required to be submitted at the time of application. Provision is made for proper investigation of the application through the city manager's office. Penalties for failure to comply with the requirements of the ordinance are fixed at a maximum of $100, with an additional jail sentence not to exceed 90 days to be determined at the discretion of the court.

The necessity of some state legislation has recently been urged in New York City, where solicitation of advertising through improper use of the names of city employees' associations has become an active "racket." In one recent case the sale of advertising for the Municipal Court Attendants' Association year book was shown to have profited the professional promoters about $23,800, and the Association itself about $3,000, with numerous uncheckable transactions involved. Commissioner of Accounts James A. Higgins, in bringing this to the attention of the Mayor, recommended new penal legislation controlling the "farming-out" of such advertising concessions. Another instance, on record in the office of the District Attorney, is of the annual benefits of the Veteran Firemen's Association and the Veteran Officers' Association which have been managed by racketeers so that 60,000 to 100,000 tickets have been sold for dances in a hall with a capacity of 2,000.



MECHANICAL SCREEDING AND FINISHING ON THE ASPHALTIC CONCRETE SECTION OVER THE OLD GRAVEL BASE

Two Types of Bituminous Surfacing on a 14-Mile Gravel Road

By **C. R. STOKES**
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WISCONSIN has a large mileage of gravel- and stone-surfaced highways, many of which are in splendid condition, and many of them will probably provide excellent bases for preservation. A few have already been selected for experimental purposes, and various types of resurfacing have been tried. U. S. Highway No. 2, in Florence County, traverses the county for a distance of 14.05 miles and crosses the Michigan state line at both ends. It carries an average of 840 motor vehicles per day, and the entire 14.05 miles, with the exception of ½-mile previously paved in the village of Florence, is included in the experimental project.

The existing road was gravel-surfaced throughout and provided an excellent base for resurfacing. The soil adjacent to and under the road is in general a light, sandy loam providing good drainage. There was one stretch of about 2,000 feet where the road traversed fairly heavy clay soil and where at certain times of the year there was some frost boil action. It was by no means an extremely serious condition.

Type of Surfacing

The project was split into two sections, and two types of bituminous surfacing, each having a depth of 3 inches and an over-all width of 20 feet, were built. Each type was to have a thickened edge of approximately 5 inches, extending in from the outer edge for a distance of one foot. One section, 6.15 miles in length, was a 2-inch compacted retread base with a 1-inch top of cold pre-mixed bituminous material. The other section, 7.4 miles in length, was virtually a 1-inch asphaltic concrete top on a 2-inch asphaltic binder course. Bids were taken on the project, with the exception of the work of blading and shaping the old gravel road and constructing the shoulders, this being done by county force account. Each section was let to two different contractors with separate outfits.

Design of the Pavement Types

The actual design of mixtures, materials used, etc., was pretty well covered by the specifications, although some changes were necessary. The primer coat for the whole road was a light cut-back asphalt. Commercial crushed limestone and trap rock having a French coefficient of ap-

WORK ON THE BITUMINOUS RETREAD SECTION, SHOWING POWER GRADERS IN PAIRS TURNING AND MIXING THE AGGREGATE AND ASPHALT

proximately 10 was used in the retread base course, and the bituminous applications were of heavy cut-back asphalt. The pre-mixed cold bituminous top consisted of 80 to 90 per cent of stone graded from ⅝-inch down, 5 to 7 per cent of bitumen and a small percentage of liquefier and filler. The mixtures for the asphaltic concrete section were designed for maximum stability, workability and compressibility. Each 1,000 pounds of binder contained 40 to 42 pounds of asphalt cement, 200 pounds of sand and approximately 760 pounds of stone. Each 1,250 pounds of asphaltic concrete top consisted of 68 to 70 pounds of asphaltic cement, 494 pounds of sand, 536 pounds of stone and 150 pounds of filler. The asphalt cement was a Mexican paving asphalt of 70 to 80 penetration. The stone and sand for these mixtures were furnished from the contractors' local screening and washing plants, located in a gravel pit where the general run of the material was a hard igneous stone. Some fine sand was obtained from a bank near the asphalt plant set-up. The stone for the binder course was well graded up to 1½ inches, and that for the top up to ⅝-inch.

The mixtures for the hot-mix section showed the advantage of careful design and control. They were remarkably uniform from day to day and were very easily handled and compressed. The density of mixture averaged 2.40 for the top and 2.42 for the binder. The stability of the top mix ranged from 42.5 to 45.8 pounds per square inch in shear. The use of such a soft asphalt cement is somewhat out of the ordinary, but it is entirely in line with the best practice where it can be used without sacrificing too much stability. The mix is more durable when a softer asphalt is used and less apt to crack. At the same time, shear results secured for the mixtures in this process should be ample to insure sufficient stability. The actual bitumen content was determined from the voids in the aggregate and was kept just below the amount required to completely fill all voids.

Preparation of the Subgrade

In preparing the road, the gravel surface was first bladed and then a small V-shaped trench was cut along the outer edges to take care of the thickened edge design. The subgrade thus established was then prime coated with the light cut-back asphalt at the rate of ½- to ¾-gallon per square yard. The amount specified was ¾-gallon, but that actually used was dependent upon how much the gravel would take up. This varied according to the quantity of clay present and also with respect to the amount of oil that remained on the road from applications made the year previous. Small areas of loose gravel or sandy subgrade were removed and later filled with the base course composition. In spite of the fact that a complete detour was established for the project, traffic was allowed over the road three days to a week after prime coating.

Construction Details on the Cold-Mix Section

As soon as feasible after the prime coat had been applied, both contractors started the work of constructing or placing the surfacing on their respective sections.

The first operation on the retread section consisted of hauling and spreading the crushed stone. The stone was delivered in railroad cars at a siding at about the center of the section and loaded into trucks directly from batching bins. It was hauled to the roadway and spread upon the subgrade in sufficient quantity to produce a 2½-inch loose depth over-all, allowing for the extra material required to fill the side trenches. The stone was graded from ¾ to 1½ inches in size, and the amount necessary for the 20-foot width was about 1,000 cubic yards per mile. After the stone was spread and bladed, all stone in the side trenches was removed and thrown into the roadway proper before applying the bitumen.

The heavy cut-back asphalt was applied by a pressure distributor at about 175 degrees Fahrenheit, in two separate applications of about equal portions, totaling ¾-gallon per square yard. After the first application the blading was started at once and continued until all stone was partially coated and the mixture attained a uniform color. The blading was from side to side, and usually about eight separate bladings were necessary. Two and sometimes three power blades were used in this work. On a few occasions, the stone with its first application of bitumen after mixing was bladed into windrows and allowed to stand over night, and then it was again spread out by blading before making the second application of asphalt. Such procedure, however, might be inadvisable under adverse weather conditions.

Immediately following the final blading after the first application of bitumen, the second application was made and the same process of blading was repeated. At this time the mixture was bladed into the side trenches. The last blading operation produced the final grade. During grading it was sometimes necessary to resort to some hand work to keep the side trenches free of stone. After the last blading the base was rolled with two 3-wheeled 10-ton rollers until unyielding. Any low places that were present after rolling were filled in with material and rerolled.

After the base course had been thoroughly rolled, the keystone was applied by means of a spreader box attached to the truck. This stone was a gravel aggregate graded from ⅜- to ⅝-inch and was applied at the rate of about 15 pounds per square yard. It was distributed by brooming or float dragging and was then thoroughly rolled into the base. The base course was opened to traffic as soon as possible after the final rolling. The traffic helped to compact the base; in fact, it seemed to have a better tightening action than the roller. There were no break-ups at any point in the base.

After about ten days of traffic on the base, the contractor started laying the premixed cold bituminous top. This material was manufactured at a distant point in the state and shipped to the siding near the job in railroad cars. The cars were steamed with 80 to 90 pounds pressure, which resulted in heating the mixture to about 125 degrees Fahrenheit. This was done to facilitate unloading. The material was unloaded directly into trucks by means of a clamshell bucket. The mixture was shoveled and raked into place by hand and rolled with a 3-wheeled 10-ton roller as soon as laid. Washed sand at the rate of about 6 pounds per square yard was then cast upon the surface to prevent picking up under traffic. It was immediately opened to traffic, and after one or two weeks a seal coat of heavy cut-back asphalt was applied at the rate of about 0.2-gallon per square yard, and sand was again cast over the whole surface. This completed the work on this

section, and the surface was finished except for the final compression under traffic.

Construction Details on the Hot-Mix Section

The mixtures for the asphalt concrete section were produced at a railroad-car plant having a rated capacity of 2,000 square yards of 2-inch surface per day. The plant was equipped with screens for three sizes of stone and one for sand, with a storage bin for each screen. Each ingredient was accurately weighed into a batch box which discharged directly into the pug-mill mixer. Aggregates were delivered to storage piles at the plant by truck and handled to the material elevator by crane. Asphalt was supplied in tank cars and pumped from them directly to the plant by way of a single storage tank.

In the mixing operation, aggregates were drawn into the mixer first and were given a dry mix of 30 seconds for top and 15 to 20 seconds for binder. Then the asphalt cement was added and the whole mixed for another 15 to 20 seconds. It is believed that this procedure insures against thin films of asphalt cement in cases where the mineral is at temperatures from 450 to 600 degrees Fahrenheit. During the dry mix, the dust, sand and stone reach a common temperature of 400 degrees Fahrenheit, which is more conducive to a proper coating of the aggregate with the asphalt cement.

Throughout this section, binder was laid in the afternoon and covered with top the next morning. A small portion of the work was laid by the usual hand method of shoveling the hot mixture into place and raking out to grade. The remainder was laid by means of an asphalt finishing machine which rode on secured steel side forms set to grade. The front screed member was adjusted vertically so that it dropped down inside the forms when binder was being laid, and rode the forms when top was laid. When the machine was riding on top of the forms, the entire weight of the front screed mechanism rested upon the freshly placed top mix, with the result that there was little so-called "knock-down" for the rollers. In other words, the screed applied a considerable initial compression.

The binder mixture was delivered by truck to the roadway, deposited on the subgrade and shoveled roughly into place. It was raked out by hand or struck off by the finishing machine and then immediately rolled by a 3-wheel 10-ton roller and 10-ton tandem roller. On one section of the job, the side trenches were filled in advance of the regular binder course and tamped in place by hand. This proved to be the best procedure on the all-hand work, but in the case of the machine-finished work, the trenches were filled when spreading the entire width of pavement. There were some loose sections of subgrade, especially at each location of the truck turntables, and at these points the loose material was removed and filled with binder rolled in place. All unevenness of subgrade was corrected with binder mixture.

On all the machine work the forms remained in place until after the top was laid, being removed immediately following the final rolling. On all hand work, the forms were removed the morning after the binder was laid and were not used for top. Instead, wooden strips of the proper thickness were spiked along the outer edge of the binder made the previous day. The top was laid in the same manner as the binder. The top mixture was delivered to the work at a temperature of about 325 degrees Fahrenheit, while the binder approximated 275 degrees Fahrenheit.

Both binder and top as well as the retread section were carefully straight-edged and any unevenness of surface was immediately corrected. Following the final rolling of the top, portland cement was swept into the surface and rolled.

Labor and Materials

The following labor organizations, equipment and materials were used on the two sections:

Retread Section.—The prime coat work required a distributor and three men. Spreading the stone required three trucks, one crane and three to five men. Applying the bitumen and general work on the retread base course required a distributor, three trucks, two blades, two rollers and nine men. The pre-mixed top required the use of trucks, rollers and a crew of sixteen men. The stone was spread at the rate of 260 cubic yards per working day, and an average of 1,975 square yards of pre-mixed top was laid per working day. A total of 48,888 gallons of cut-back asphalt was used for prime coating, 60,330 gallons for the base course, and 12,023 gallons for the seal coat. A total of 6,100 cubic yards of crushed stone was used for the base course, and 7,434,000 pounds of the pre-mixed top mixture was used.

Asphaltic Concrete Section.—The prime coat work on this section required a distributor and three men. The plant crew consisted of one foreman, two engineers, eleven laborers, five trucks and drivers. The roadway crew consisted of one foreman and nine laborers on forms and turntable, one foreman, two roller men and eleven laborers on the laying operation. The average production per 10-hour day of completed 3-inch pavement was 1,600 square yards. A total of 45,614 gallons of cut-back asphalt was used for the prime coating, 12,750 tons of binder mixture was used, and 4,973 tons of top mixture.

Ideal weather conditions prevailed throughout the work. There was very little rain and the weather was hot, the temperature ranging about 78 degrees.

Costs

The only figures available for the cost of this improvement are the actual contract prices. The force account agreement with the county for preparing the subgrade and re-shouldering amounted to $1,100 per mile. The cold-mix section, covering 72,830 square yards, cost 96 cents per square yard. The hot-mix section, covering 87,417.7 square yards, cost 93 cents per square yard. The total engineering cost on the whole project, including plans, inspection, supervision, tests, etc., amounted to $8,721. The cost per mile of the whole project, including the county force account but not the engineering cost, amounted to $12,250, and, including the engineering cost, amounted to $12,891 per mile.

Conclusions

The experience gained in the construction of these two sections suggests a few improvements and details which might be advantageous in further work of this nature. It is believed that it would be advantageous to complete the prime coating considerably in advance of the actual con-

struction. This would give traffic an opportunity to stabilize the subgrade and thus develop any loose or weak spots which could easily be corrected during the work. The presence of fresh prime coat material is not particularly objectionable on cold-mix work, but it is on hot-mix work, unless the prime coat material has completed its evaporation. At the start of the asphaltic concrete section, a few small spots of freshly applied prime coat bled through the binder and top, and these spots had to be cut out and replaced. In binding the prime coat for immediate traffic, pea gravel or small stone chips should be used instead of throwing on sandy and dusty material from the shoulders. This latter material tends to seal into a mat and prevent evaporation, which is essential in the use of cut-back asphalt.

The use of the V-shaped trench to produce the thickened edge is objectionable from the standpoint of construction. On the retread section, it was practically impossible to secure as smooth a surface on the outside foot or so as in the main portion of the pavement, owing to the uneven compression in the trenches. On the hot-mix type, where the finishing machine was used, the trench section was more easily handled. It is possible that a widened base might be more desirable as an edge protector.

One of the most interesting features of the work was the use of the finishing machine. It left an excellent grade on both binder and top. Its use has been reflected in the riding qualities on the section in which it was used, for there are fewer inequalities and less unevenness in this section than in the rest of the work.

An item of equipment which undoubtedly would have assisted very appreciably in the work would have been the employment of spreader boxes on the trucks dumping hot-mix material. Two or three men could have been eliminated had the boxes been used. In general, however, the two sections constructed in Florence County are satisfactory, and as they are distinctly different types, it will be very interesting to observe their appearance after a few years of service.

ACKNOWLEDGMENT.—From a paper read before the Association of Asphalt Paving Technologists at the Ninth Annual Asphalt Paving Conference.

A New Regional Market Dedicated at Buffalo, New York

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A NEW marketing district, the "Niagara Frontier Food Terminal," was opened for business in Buffalo on March 16, 1931. The creation of this combined terminal and farmers' market, although not a municipal project, initiates a new step in city marketing which should be given a prominent place in future city planning programs. It creates a modern food-handling district designed to care for the food needs not only of Buffalo but of all the western New York region and parts of Pennsylvania and Ontario, Canada.

This terminal is unique in that it combines facilities for the handling and sale of all classes of foods and food products in an area separated from the congested section of the city, but at a point easily accessible to this section as well as to the residential section, the future Buffalo, the out-of-town demand area, and the local and distant supply areas.

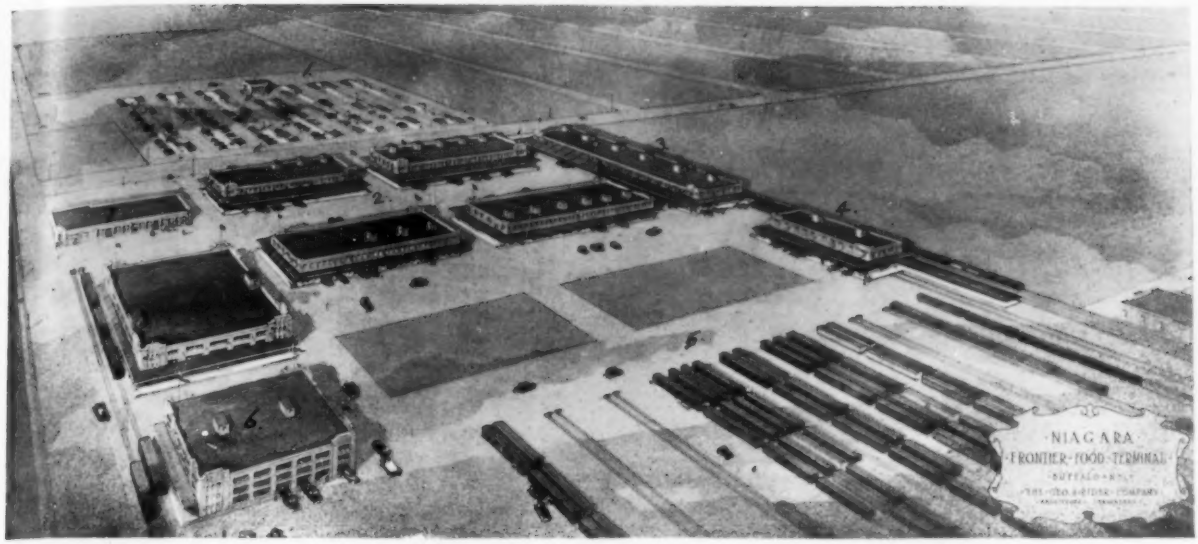
Here the local farmer, the trucker dealer, the distant shipper, the canner, the wholesale grocer, the meat handler and every other food producer, manufacturer or purveyor, may find a place to meet and deal with all classes of buyers, particularly the wholesaler, the jobber, the retailer and the inter-city truckers from all over the region. With the modern facilities provided, all these classes of buyers and sellers are able to deal quickly on a strictly competitive basis and receive immediate delivery.

A 20-Acre Farmers' Market

The food terminal comprises an area of 60 acres, 20 acres of which is devoted to a farmers' market for the handling of locally grown produce. This market is provided with the latest facilities for handling such produce and is operated by the farmers themselves. Their contract with the developers gives them an option to purchase this market, which option they will undoubtedly take advantage of in the course of time. It is expected that dealers in all classes of farm supplies will seek locations on the available area of the farmers' market.

The shipped-in green goods are handled through four buildings divided into compartments 24 x 100 feet. Each unit faces on two of the wide streets and has sheltered truck-level loading platforms. Each unit includes basement space for storage and second-floor space for offices or sales rooms. The spacing of the buildings insures a maximum of lighting and air and a freedom from congestion in delivery and transfer of produce. Butter, eggs and dressed poultry are provided for by a large building which is divided into compartments to suit the trade, equipped with refrigeration, direct rail connections in the rear and wide, covered, truck-high platforms in front. The building for handling live poultry is also divided into rooms to suit the trade. This is located at some little distance from the other facilities, has rear-door rail connections and every modern facility for handling live poultry. Hold yards and team tracks having a capacity of 350 cars daily adjoin the market buildings on one side. Two large buildings with rear-door rail connections are provided for the use of wholesale grocers and other handlers of prepared foods.

To care for the business of this market, another building



DETAILS OF THE LAYOUT

1. Farmers' market
2. Shipped-in produce house
3. Butter, eggs and dressed poultry
4. Live poultry rooms
5. Team tracks and hold yards
6. Wholesale grocers
7. Bank, restaurant and offices

is provided which houses a bank, a restaurant, a barber shop and offices.

Ownership and Control

The shipped-in produce section of this market is owned and operated by the Market Holding Company, Inc., a subsidiary of the Erie and Nickle Plate Railroads. The farmers' section of the terminal is owned by these railroads and operated by the Niagara Frontier Growers' Cooperative Market, Inc.—a cooperative organization which comprises the principal vegetable producers supplying the Buffalo market and is open to membership to all farmers of the region who desire to use the market.

The effect of this terminal on food distribution and the development of the agricultural possibilities of the region should be studied carefully by other cities.

Administrative Assistant to Mayor Suggested in Detroit

IN view of the frequent changes in the government of Detroit, Mich., including ten mayors in sixteen years, and resultant disorder in administration, Dr. Lent D. Upson, Director of the Detroit Bureau of Governmental Research, has recently suggested the creation of the office of administrative assistant to the mayor, as a continuing official who would act as the mayor's deputy in administrative matters.

While conceding the merit of the city-manager plan, with a manager appointed by the council, Dr. Upson points out that, considering the generally high level of municipal government that has prevailed in Detroit, it is unlikely that such a drastic change would be generally favored at this time. His proposal would involve appointment by the mayor, but, in an effort to prevent political appointment and change, he suggests that certain minimum qualifications for the office be set up in the city charter, and that the Civil Service Commission be authorized to conduct examinations and certify to the mayor the three or four names highest on the list, for the appointment. The mayor would be permitted to dismiss the assistant, on charges, but could refill the office only from among those declared eligible by the Commission.

Advantages claimed for the plan include the following:

1. A very considerable proportion of administrative detail could, and probably would, be delegated by the mayor to such officer. As new mayors came into office, unfamiliar with the details of public affairs, it is probable that more and more responsibilities and duties would find their way to the desk of the assistant.

2. An incoming mayor would have as his aid an official entirely familiar with the administrative features of the government, from whom he could quickly have the facts at hand with respect to any administrative problem raised. This condition does not exist at the present time, particularly if the more important officers go out of office with the mayor.

3. Experimentation and improvement in administrative procedure and the carrying-out of administrative programs probably would be continuous regardless of changes in the mayoralty, and would be subject to the continuous attention of a competent person. At the present time, the period between elections is so brief that no mayor has a proper opportunity to consider improvements in administrative procedure or to undertake their successful installation.

4. The mayor could continue as the policy-promoting head of the city government, urging on the public and the common council definite governmental policies which may be for the benefit of the community.

5. The successful selection of a competent person for the position of administrative assistant by the merit system should eventually suggest the application of a similar plan to the selection of the commissioner of public works, the controller, the corporation counsel, and the police commissioner, in particular, and probably of other officers immediately subordinate to the mayor, so that the periodic dismissal or resignation from office of these officials would be substantially curtailed.

In this connection it is interesting to note that the new charter recently adopted in San Francisco (see THE AMERICAN CITY for April, page 51) includes provision for a chief administrative officer, to be appointed by the mayor.

Safeguarding the Lives of Los Angeles Swimmers

By C. P. L. NICHOLLS
Supervisor of Aquatics,
Los Angeles Playground and
Recreation Department

THAT it is possible to maintain a "no drowning" season on a municipal beach, provided "Old Lady Luck" is on your side, was amply demonstrated during the season of 1930. The Los Angeles Playground and Recreation Department operates some five miles of beautiful sandy beaches, patronized by an estimated attendance of ten million persons yearly. The maximum part of the bathing season opens about the first of May and closes shortly after Labor Day, although there is an appreciable amount of surf bathing throughout the year. The ocean temperature rarely falls below 54 degrees, with summer temperature ranging from approximately 62 to 72 degrees, and winter temperature from approximately 52 to 62 degrees.

Organization

For purposes of good operation and safety, the beach is divided into four sections, each in charge of a Life Guard Captain. Each Life Guard Captain has from eight to seventeen men reporting to him. He in turn is responsible to a Director of Beaches, who is the administrative head of all four beach sections. The Director of Beaches in turn is responsible to the Supervisor of Aquatics, who has jurisdiction over all departmental water activities, including the present twelve swimming pools, two beach bathhouses, the waterfront boathouse, and the public beaches.

A total of 235 rescues was made during the 1930 season. No fatalities occurred on any municipally operated beach. This record was due to the constant vigilance of the life guard crew, which was provided with adequate and necessary equipment.

The number of life guards throughout the summer fluctuated somewhat with the weather and the attendance. During July and August there were as many as fifty guards on duty.

Don'ts for Surf Swimmers

1. Don't over-estimate your swimming ability, especially at the beginning of the season when the swimmer is not in training. Over-enthusiasm is often fatal.

2. Don't bathe immediately after eating; cramps frequently result.

3. Don't bathe in remote places, but always stay near a life-guard station.

4. Don't make long-distance swims alone; always swim accompanied by a strong swimmer.

5. Don't use inflated rubber play apparatus, such as tires, tubes and water wings, in the surf; you may be carried out to sea on them and be unable to return.

6. Don't call for help unless actually in trouble. Otherwise you may call some time when you do need a life guard and be ignored. Don't be timid about calling for assistance when you need it.

7. Don't swim near piers or pilings, as they cause strong currents and have sharp cutting surfaces.

8. Don't take "dares" in the ocean.

9. Don't go to the assistance of a life guard on rescue duty until he calls for help. He can handle the ordinary situation, and he may have to help you.

10. Don't dive into unknown water. Always explore thoroughly before running into the surf. When in doubt ask the life guard. It is part of his job to know.

11. Don't lie in the sun and try to acquire a quick tan; it will always result in painful sunburn. Don't sleep in the sun, as you may oversleep and wake up a cinder.

Equipment

A list of the safety equipment used on the Los Angeles municipal beaches includes the following:

Two fast emergency call cars arranged with floor space to carry full length (72-inch) stretchers. As regular equipment, these cars carry two red top lights, a white searchlight, one electric siren, two portable electric hand lanterns, one inhalator (H-H type) with spare carbogen tank, four blankets, four chemical heat pads, one barrel containing 800 feet of 3/16-inch diameter hemp life line, two copper surf cans, one stretcher and one first aid kit. The kit contains the following supplies:

2 compresses (eye dressing)
1 tube Butesin picric ointment
1 dozen iodine swabs
3 packages 3½-inch compresses
4 packages 2-inch compresses
4 40-inch triangular bandages
3 absorbent gauze compresses
1 package paper cups
3 packages mercurochrome swabs
2 packages ammonia inhalants
11 packages ammonia ampules (stimulant)
2 packages wire splints
2 3-inch bandages
1 strap tourniquet
1 pair forceps (splinters)
1 pair scissors
1 roll adhesive tape

The car carries a crew of three men who are trained drivers, as well as trained first aid men. However, their instructions are to give only the barest emergency treatment. In no case are they to do other than get their patients to the doctor in the best possible condition, avoiding the injuries often received from poor handling or lack of intelligent primary treatment. The call crew, as well as the remainder of the guards, are thoroughly trained in the performance of artificial respiration by the Manual Schaefer Method, supplemented when necessary by the use of the inhalator. Many lives have been saved by the prompt application of this method of resuscitation on apparently drowned persons.

Regulations

In order to keep the guards on the alert, as well as facilitate the work of the guard, towers are placed along the beach within the area allotted to each guard to patrol. These towers provide a place where the guard may sit while resting, and they give protection from the wind. The tradition in the Los Angeles crew is that a good guard is either "on his feet or in his tower." Sitting or lying on the beach while on duty is absolutely taboo. These towers are equipped with a locker box containing a limited first aid kit for the use of the guard in very minor cases. Under no circumstances may he give secondary treatment, which he is often called upon to do, and except for very minor treatment he is always to call the emergency car, in which case the patient will be taken to the emergency hospital. The tower kit includes the following supplies.

1 barrel life line 500 feet long for surf assistance
1 life can or surf can
1 8-inch brass bell with clapper (for calling the guard)
6 aqueous ammonia ampules
6 iodine swabs
6 mercurochrome swabs
6 ammonia inhalants
1 enamel cup
2 36-inch triangular bandages
1 short stick for use with triangular bandage as tourniquet
1 roll 1-inch adhesive
1 roll each of 1-, 2-, and 3-inch gauze bandage
1 pair each of scissors and tweezers

It will be noted that there is little in this kit that would need more than the barest first aid knowledge to use intelligently. This is what we term our "fool-proof" kit.

Regarding the various types of life lines used, stationary and portable reels and spools, thin wire, etc., we have tried out many of these on our crew, but finally have adopted the 5-gallon barrel, which will contain 500 to 700 feet of coiled 3/16-inch hemp rope. It has been our experience that this equipment is easily transported on the run, will not snarl when being fed to the outgoing guard, and is amply strong to pull four people on a surf can. We have experienced great difficulties with the snarling of the rope on the reels and have adopted the small 3/16-inch line as being economical, strong and easily transported. These lines are of great importance in pulling a guard with a victim through the surf. Of course, the line is taken out to the rescuing guard and the victim by a second guard who carries the rope end attached to a surf can. The victim then holds to the can, while the two guards and the victim are towed slowly ashore by the call crew. If too much speed is used on the return trip, the result is usually a ducking. We have found that the ordinary hand-over-hand pull is the best for all hands concerned.

ONE OF THE LIFE-GUARD CARS
and the emergency equipment and crew, always ready to respond to first aid calls

A CAPE COD DORY
Note the fact that the oarsman at the back stands

Call Equipment

A stunt which we have found very effective in serving to get emergency calls quickly over the telephone along the beach has been to provide every telephone near the beach with a cross-shaped red cardboard tag containing the telephone number of the main call station and the directions: "Always state location of emergency." The red cross has been used because it connotes safety and emergency work, owing to the excellent promotion of the American Red Cross in this line of endeavor. These tags are also carried by the guards, usually in the lining of their caps. If a guard believes he will need assistance in making a rescue, he throws the tag to a bystander, as he runs for the water, saying, "Call this number, will you? I need help."

At various locations along the beach, buoy lines are placed. These are anchored approximately from 150 to 200 yards from shore, and fastened at the shore end to a post on the beach; 1½-inch rope is used in 60-foot section supported by heavy navy type metal buoys. This line serves as a congregating spot for weak swimmers, and enables many who are timid to enjoy the pleasures of the surf. The line is always there to grasp and to provide a means of getting ashore. One might suppose that this line would serve as a hazard in offering encouragement to these weaker swimmers to venture beyond their depths. This has not been our experience, however, for a rescue near a buoy line is an almost unheard-of occurrence, while during the time of summer crowds a very definite grouping of swimmers can be noted at spots along the beach where these buoy lines are placed. Places of comparative safety are always chosen for the spotting of the line.

Part of the regular equipment of the beach safety scheme includes the Cape Cod type sea dory. We have had these boats on the beach for five years, and have yet to make a rescue with one. Either the surf is too high, or the guards get after their victims too soon to make the sea dory useful as yet.

Emergency Analyses

Every one of the 235 rescues on the nine miles of beaches operated by the Los Angeles Playground and Recreation Department during 1930, was made in water from 75 to 100 yards from shore. An interesting fact shown by our figures is that the *male of the species is more foolhardy than the female.* There were 156 males rescued against 79 females. Boys still will be boys!

Rip tides and tidal currents were directly responsible for 71 per cent of the emergencies. This seems to indicate that if the public would become better acquainted with these hazardous phenomena of the sandy beaches in southern California, the life guards would have an easier time of it. Although a high surf in the summertime is exceedingly rare, the height of the waves on such occasions often reaches from ten to fifteen feet. It is unsafe for any one but an expert to swim at such times. The records show that 13 per cent of the total rescues were made at such times.

Eight per cent of the rescues were of those who overestimated their swimming ability. Of this group, the majority were women, who do not possess the strength of their brothers, and who usually become frightened more easily. Three per cent were due to the use of unfit surf boats. Any boat is dangerous in the surf, even for the expert.

Three per cent of the total number rescued were those who were trusting for their safety to various types of play equipment in the surf. One needs free hands and supple muscles to cope with a strong surf. Old rubber inner tubes have proved to be very poor substitutes for them.

Cramp resulted in but one per cent of rescues, and one per cent of those rescued were would-be long-distance swimmers unaccompanied by any sort of tender boat.

A careful consideration of the figures mentioned above can only lead one to the conclusion that by far the great majority of rescues could be prevented if the public would better heed the warnings of the life guards to stay out of rip tides and tidal currents, not to use play apparatus in the surf, to keep a safe distance from piers, and to refrain from taking long-distance swims unaccompanied by a tender boat.

Our study indicates that by far the great majority of accidents are preventable, and happen either because of ignorance of the ocean condition, or foolhardy activity by the younger people. It also indicates that an educational campaign on beach safety precaution would be effective. This would include such information as is shown in the Beach Safety "Dont's."

Town Planning as an Educational Force

"IT is a most notable feature about town planning that civic art projects when incorporated as part of the city plan will frequently create and stimulate art ideals in the minds of the ordinary citizen who hitherto has looked askance at the expenditures of money for this form of civic betterment," Professor F. E. Buck told members of the Pacific Northwest Association of Planning Commissions, of which he is President, at its recent annual meeting.

"One must have such ideals. The average citizen in his capacity as citizen has altogether too few. Perhaps the reason may be that hitherto he has lacked leadership in this respect. That inspiration and that pride of place possessed of old by the Athenian and the Roman, which came to them through their beautiful public buildings, are coming back to many of us. And we should rejoice that this is so as we set about the task of remaking some of our cities to function in all these glorious ways in which a great city may properly function, and indeed should function, for our enjoyment, our health, and our prosperity."

"Today, the . . . *type of ideal citizenship* is well exemplified in that comradeship which provides for your neghbor as much parking space as you need for yourself; which provides him with as ideal drinking water, as clean bathing beaches, as beautiful parks, as safe streets, as efficient city service as you are apt to look for in the city of your choice. This citizenship also provides for as many free or paid recreational facilities, libraries, art galleries, golf courses, and other public undertakings as you would use had you made enough money for future independence in the 'ideal city' of your choice. For placing these facilities where they will best serve the real needs of the citizens and for suggesting the solutions for the more fundamental problems of city building and civic finance, the modern town planner is, and should be, held chiefly responsible."

Cost of Garbage Collection by Contract

By **ED. J. RYAN**
Superintendent, Garbage Department, Houston, Texas

PROBABLY no other factor is so important to a city's health record, general appearance and economic progress as that of modern sanitary methods of garbage collection and disposal. But it is one thing to have efficient collection and disposal of garbage and quite another to have such a service at a minimum cost to taxpayers. So far as we have been able to determine, the garbage collection and disposal costs for Houston, Texas, are lower than those of any similar city of corresponding size.

SOME OF THE CONTRACTOR-OWNED COLLECTION EQUIPMENT AND AN INSPECTOR'S AUTOMOBILE AT ONE OF THE SIX INCINERATORS IN HOUSTON, TEXAS

Ten Contractors with Adequate Equipment

Houston's garbage department is operated on a different system from many, as the collection of garbage is done by contractors working under the strict supervision of the City Department. Ten contractors maintain collection fleets that are at the disposal of the city. During the past two years, we have done much towards standardizing this equipment and towards increasing efficiency at a lower cost.

At this time the contractors have 49 pieces of collection equipment, consisting of 30 trucks, 14 wagons and 5 dump-carts. We have a working agreement with each contractor by which he must deliver his men and equipment to designated places in the city at 7 A.M. daily, where our five route inspectors check-in the equipment for the day and see that everything is up to standard. We pay a flat rate on daily schedule for trucks, wagons and carts, paying $12.75 for each 1½-ton truck with two men, $6.50 for each wagon and one man, and $5.00 daily for each cart and one man.

Each contractor has well-defined sections of the city to work in, but the direction of the routes is under the inspectors' control. These inspectors see that the equipment is started out at 7 A.M. and continues in service until all garbage collections have been made for the day, regardless of hours. No overtime is paid.

Contractors have a sufficient reserve of equipment and keep all equipment in first-class working condition. They do this because the inspectors can refuse to accept a piece of equipment, or if a particular contractor falls short in equipment on hand, another contractor's equipment is shifted in line without any conflict in the regular routine of service. The five inspectors and general route foreman have a daily meeting at the noon hour to check up and compare progress for the day. At this time, any rerouting or shifting of equipment may be done to keep a well-balanced service for the entire city.

At the end of every working day, we know exactly what our garbage collection has cost us, as our collecting is paid for on the daily equipment schedule. We are relieved of carrying compensation insurance on the men that op-

erate this equipment. We have no maintenance, replacement or care of equipment to contend with. Every contractor finds it to his own advantage and profit to keep his fleet in first-class condition. We have no claims for missing or damaged garbage cans, etc., as every contractor is responsible for his own route. Each contractor maintains his own payroll, hires and discharges help, eliminating a lot of office work and general operating overhead for us.

Collections

We collect garbage from the business district of the city daily. Our close-in residence section has garbage collection three times weekly; all other sections twice weekly, with the exception of one sparsely settled new addition where collection is made but once weekly.

Slop and refuse from hospitals, restaurants, hotels, boarding houses, etc., is moved at night by private collectors, who use the collection for hog feed. The work is done under the supervision of an inspector from the City Department, and he sees that sanitary measures are in force. The private collectors likewise remove all trash and similar accumulations from these institutions in exchange for the privilege of removing the slop. They removed 10,215 tons of garbage free of cost to the city in 1930, in addition to removing 1,061,230 gallons of slop.

Clean paper from the business section of the city is likewise removed without cost to the department by a local paper stock company.

Disposal by Incineration

Six incinerators are operated by us. We make no attempt at salvage, believing the increased cost would more than offset profit. Garbage collections are routed to the nearest incinerator, with consideration given to the capacity of each so as to keep each plant operating normally without congestion. All equipment drivers are required to fasten canvas covers over their loads when the collection is finished. All equipment has metal bodies to prevent leakage.

Improvement in Collection Equipment

We have done a great deal during the past two years in the matter of improving equipment and speeding work, being able to take care of more garbage tonnage at a lower cost per ton. Two years ago we had 65 pieces of equipment in operation as compared with our present 49. We use our wagons and carts on dirt streets where mud is encountered. Our trucks are standardized to 1½-ton trucks, all with dump bodies. The wagons, too, have been equipped with dump bodies.

These 1½-ton trucks make an average of eight to nine loads with 3,000-pound load average. They are routed to the incinerators on schedules that do not conflict. The dump-trucks dump direct to the hopper hole, unloading within three minutes, whereas it formerly required fifteen to twenty minutes to unload with forks. We find that larger loads than the 1½ tons choke the normal disposal rate and tend to overload and tie-up the plant.

The wagons make an average of from two to three loads daily, each load averaging 2,500 pounds.

Since reducing our wagon equipment from 34 to 14 and using speedier equipment where possible, we have been able to burn all garbage in the disposal plants. Previously, from 90 to 100 tons of raw garbage was dumped daily on city garbage dumps, subject to spontaneous combustion. In addition to the fire hazard, these dumps were unsightly and the odor an annoyance. Now every ton of garbage is incinerated the same day it is collected.

Costs

By collecting the garbage by contract, we are able to place the garbage at the incinerators at a cost of approximately $1.28 a ton, covering 72.12 square miles with 990 miles of street and a population of more than 290,000.

The total collection by contractors for 1930 was 119,670 tons, collected at a cost of $153,439.75. Every ton of this was destroyed in the incinerators at a total cost of $54,293.54, or a fraction over 45 cents a ton. This gives a total of approximately $1.73 a ton for collection and disposal of garbage under the contract method, while with a competent office force and staff of inspectors, foreman, etc., the entire operating expense for 1930 was $236,202.00, or a total cost of approximately $1.975 a ton for garbage disposal. We know of some instances where this same service is costing from $5 to $8 a ton; and most cities are paying $3 or more a ton.

Town Planning in Japan Is Regional

OF the 104 cities of Japan, 92, or over 90 per cent, now have town planning regulations in effect. These regulations are under authority of the Town Planning Law created jointly with the new Town Building Law, in 1919. An interesting account of these joint laws, their operation, and the progress being made under them, was recently prepared for Jacob L. Crane, Jr., Chicago city planner, now in the Orient, by H. Kayanoki, Chief Engineer of the Town Planning Bureau, Department of Home Affairs, the headquarters of which is at Tokyo.

This report shows that all planning is regional in character. "The town planning area contains a main town and its suburbs. Its final determination is made by the Home Minister, who, after submitting the question to the Town Planning Committee, and consulting city and suburban authorities, awaits the charter from the cabinet. In general, various schemes are established within the area; therefore this area must be regarded as one unit from geographical, social and financial standpoints." Restrictions on private development are authorized under the law even when official planning activities have not been definitely determined upon.

As elsewhere, "the street system is the backbone of town planning," with zoning, the canal system, the sewerage system, the rapid transit system, given prominent consideration. Parks, cemeteries, crematoria and public markets are recognized as elements of the planned city; and excess condemnation, reservation of special lands, and replotting, as legitimate means to planning accomplishments.

The execution of all town planning schemes is carried out under the Town Building Law. Fourteen cities now have active programs under this heading,—Tokyo, Yokohama, Kyoto, Koke, Osaka, Hamamatsu, Sakai, Okayama, Kanazawa, Shikuoka, Shimizu, Toyama, and Sendai,—involving a total expenditure of 1,319,200,000 yen, or more than $658,000,000. About half of this sum is being spent in reconstruction work in Tokyo and Yokohama.

Kent County Ensures Outdoor Attraction to Its Residents

By **L. C. PALMER**
Superintendent of County Parks,
and County Forester, Kent County, Mich.

WITH the practically universal use of the automobile, the Park Commission of Kent County, Michigan, has met an increasing desire on the part of the general public for attractive outdoor retreats some distance from centers of population. Grand Rapids is the principal municipality of Kent County, and it is the people of that city as well as residents of the smaller towns and villages and of rural sections who use the parks each summer.

The county park system was started in 1924 with one park about 30 acres in size. Today the system includes 475 acres in 10 projects. All but one is now open to the public. That one will be opened as soon as a road to it has been completed. It is estimated that 1,210,000 persons used the various county parks last year at a cost to the county of a little more than 1.6 cents each.

The Kent County Park Commission has acquired the parks in various ways, but without exception the play areas open to the public for all time are particularly beautiful. By far the most important of these is Townsend Park, lying along a beautiful trout stream which winds through a wooded area. The park is 57 acres in extent, with topography ranging from very hilly to flat. There are sections that are well wooded, and open areas which have been equipped for baseball, horseshoes and playground games of various sorts. In shaded sections are picnic tables and benches. Improvements such as shelter houses, bridges and roadside protections have been constructed to blend with the natural attractiveness of the scene.

In many instances natural field stone, abundant in this area, is used in building guard fences along park drives, and foundations for culverts and bridges, and, in combination with logs, in the construction of the principal park buildings.

A large amount of planting has been done in this park with native trees and shrubs, such as white pine, red pine, white cedar, red cedar, white and red oak, soft maple, white birch and elm. Of the shrubs, we have used only native varieties such as dogwoods, hazels, elders and viburnums. A large number of native wildflowers also were planted in the swampy portion. Large expanses of grass are kept mowed with power equipment. Stoves, tables, benches, wells, refuse burners, toilets, roadways—in fact all of the physical property of the park—are kept in excellent repair throughout the season, regardless of patronage.

Scenic Character Kept

The equipment and standards of maintenance in Townsend Park are to be found in all the county parks that are used extensively by the general public. In each case, however, in the organization and planning of the park area, emphasis has been placed on the natural beauty and its preservation. The parks have been laid out in various parts of the county, so that practically every section is served, but always with due regard to the picturesque.

Fallasburg Park, with a total area of 81 acres of well-wooded, hilly and flat land, has more than a mile of frontage on beautiful Flat River. Two beautiful little streams flow through the park and join the river. On high ground near the road are ball diamonds and other equipment, and along the courses of the small streams and on a large flat area (bottomlands of the river) the principal picnic grounds have been laid out. This park is about 25 miles from Grand Rapids, and it was patronized by about 75,000 persons in 1930, its second year of operation.

Gordon Park differs from the first two in that it was created specifically as a tourist camp. This 30-acre section of woodland is the only publicly owned tourist camp on United States trunkline U. S. 131 within a 50-mile radius of Grand Rapids. It has naturally been very heavily patronized, and has also been much used as a picnic ground and recreational center. Playground equipment has been installed, including tables, benches, settees, stoves and a well. A baseball diamond is steadily used in season by neighboring villages. Here, as in most of the other parks, full-time caretakers see that everything is kept in excellent order.

Caledonia Lakeside Park is a beautiful wooded area within the village of Caledonia and on picturesque Emmons Lake. The park has 20 acres of woodland and 10 acres of fairly open land, a part of which is used for a ball diamond. The Commission plans to offer swimming and boating pleasures as soon as certain sanitary conditions with regard to lake pollution by sewage have been met.

Chief Hazy Cloud Park is one of the smallest but one of the most heavily used parks. It is but 10 miles east

EVANS ROAD
Showing preservation of roadside growth

THE CALEDONIA LAKESIDE PLAYGROUND

TOWNSEND PARK
The bridge over Bear Creek

of the city on Grand River. This 4-acre playground was patronized by more than 50,000 people in 1930.

White Pine Park is a forest preserve containing 20 acres of white pine and oak trees, the tract of land having been purchased with the idea of preserving one of the few remaining tracts of pure white pine in Kent County. The park is used somewhat for picnic purposes, but is more valuable as an educational project.

Johnson Park, with a total area of 179 acres, some day will be perhaps the pride of the Kent County park system, because of its size, its nearness to Grand Rapids, its long shoreline along Grand River, and its location on the belt line now being constructed around Grand Rapids. The park has more than 100 acres of wooded and hilly land, and the remainder is rolling to flat and fairly open land. The river bank is well wooded and will make ideal picnic spots. The open land is being so laid out as to make fine playground sites.

Another new park is Wabasis, a 35-acre tract around a bay of Wabasis Lake, the largest body of water in the county. The park lies on uneven ground with level sections at the top of the slope and at the bottom along the lake shore. Practically all of the tract is beautifully wooded.

An Interlocking Organization

The Park Commission, whose members are identical with the Road Commission, also includes in its 475-acre park development the improvement of a 4-acre tract called Fisk Knob, which is the highest point in the county. A county road has been constructed to the top of this knob to permit motorists a view of the countryside. The Commission also maintains a park at the entrance to the airport.

Some of the parks were acquired by gifts of old residents in the section, who wish to preserve for posterity the beautiful lands which they had owned; others were purchased outright by the county, and still others were obtained in deals over right-of-way for highways. Total disbursements for the entire park system for the fiscal year ending September 30, 1930, were $20,381, including the cost of caretakers, ground maintenance, permanent improvements and supplies. The parks are supervised by the Park Commission and are under the care of the county engineer. The direct operation is in charge of the county forester.

Enhancing Highway Beauty

Besides the play spaces in Kent County, the Forestry Department is spending considerable time and effort in making all the county roads beautiful as well as serviceable. This is being accomplished by acquiring additional right-of-way along existing highways; preserving native trees, shrubs and flowers wherever and whenever possible; planting trees, shrubs and native flowers; trimming existing trees and shrubs; seeding and sodding; proper control of utility companies operating on highways; landscaping traffic islands; elimination of roadside advertising signs, weed cutting, clearing out places along the roads for attractive views.

Work by public utilities consists chiefly of locating new pole lines and relocating old lines. The present tendency of the utility companies is to keep their lines a minimum distance of 45 feet from the center line of the highway, thus eliminating tree trimming around the wires and preventing trouble in storms due to falling branches and rubbing of wires against branches. Having the pole lines back of the trees also improves the appearance of the highway itself.

Thus the Forestry Department under the Road and Park Commission has three chief aims—to keep in efficient operating order all the Kent County parks and playgrounds, to make the highways safe so far as the roadside development is concerned, and to make the roads as attractive as possible. It is only necessary to travel over Kent highways and through Kent parks to determine what scientific roadside and park development can accomplish.

COMMUNITY BUILDS SIDEWALKS ALONG HIGHWAY TO SCHOOL

IT is dangerous to be a pedestrian, particularly a young pedestrian on the way to or from school. Realizing this and as a move to lengthen the life expectancy of its young residents, St. John the Baptist Parish [county] in Louisiana recently approved a plan wherein a mile of sidewalk will be built along each highway leading to a school.

Very few local communities, and still fewer states, have as yet made sidewalks along country roads legally possible. Last spring New Jersey's Legislature approved a measure permitting the State Highway Commission to build rural sidewalks. Wayne County, Mich., and Allegheny County, Pa., have constructed such sidewalks with success.

More local communities and state highway departments might effectively cooperate in building these walkways, or, if the laws do not now provide for such construction, in changing the laws.

The Place of Building Lines in Widening Narrow Streets

By HERBERT S. SWAN
City Planner, New York

THE establishment and maintenance of building lines is one of the most vital steps in the ultimate realization of a major thoroughfare plan.

The question may be fairly asked: "Why establish building lines instead of immediately widening a street through the purchase or condemnation of the property required? The answer lies in the fact that the establishment of building lines is more economical than immediate widening. A street widening almost invariably involves demolition of buildings. The establishment of building lines, on the other hand, need destroy no existing building. Pending the ultimate widening of a street, existing buildings are generally allowed to remain. Building lines, in a word, conserve the existing buildings until they are voluntarily demolished and reconstructed by their owners. A street widening resulting from the establishment of building lines awaits the convenience of the property owner, and thus involves the least possible expense to both property owner and city. An immediate street widening is often more or less of a Pyrrhic improvement; it almost invariably involves the demolition of the very buildings which it is intended to serve. Street widening by means of building lines avoids this ruinous loss. The importance of conserving present building values becomes obvious when it is remembered that in the case of many parcels, the building value exceeds the land value, three, four, or even five and six times.

Suggested Building-Line Legislation

Building lines are today unknown in many cities. There is no provision for their establishment in either the city charter or the general state law. To remedy this situation it is suggested that legislation somewhat along the following lines be secured by cities:

The city council shall have power to establish building lines on the land adjoining any street within the city between which line and such street no building or part of building shall thereafter be erected. After the establishment of a building line, no permit shall be issued for the erection of any new building or for structural alterations to any existing building between such line and such street.

The city council may require the removal of all buildings or parts of buildings, embankments, steps, walls, fences, gates and plantings existing outside of such building line at the time of its establishment; or the city council may in its discretion permit such aforesaid structures or encumbrances to remain and to be maintained to such an extent, under such conditions and for such a period of time as it may prescribe in the ordinance establishing such building line, provided, however, that such period of time shall in no case exceed 25 years from the date of establishing such line. At the time of the establishment of a building line, the city council may determine whether a fee or an easement shall be acquired in the lands affected, and it may prescribe such conditions and limitations on the title to be acquired and as to the temporary or permanent use of such lands as it may deem proper. If not inconsistent with such limitations and conditions as to title or as to use, the land between such building line and such street may be devoted to general street purposes whenever the city council shall determine that public interest requires such use.

The above would be merely a grant of power of the legislature to cities to establish building lines. It is by no means a complete bill. Any legislation passed along these lines should provide for the assessment of benefits and damages, for the provision of appropriate assessment machinery, and for penalties to be inflicted for the violation of the building lines established.

The above legislative grant varies in several respects from the usual statutory provisions relative to building lines. In the first place, the customary legislation is limited to the mere imposition of a building-line easement; there is no permission granted the municipality to convert

A Comment by Edward M. Bassett on the Accompanying Article

Many cities suffering from traffic congestion are busy with major thoroughfare plans. Existing streets must be widened. How? Automobiles have created new street problems, especially in business areas. Storekeepers insist that the streets must be used for parking. If storekeepers prevail, how shall street space be increased? One way is by outright condemnations of street widenings. But this method means great awards for cutting off fronts of buildings.

Another way is to condemn non-buildable strips alongside the street. In some states they are called court-yards, and in others building lines. Under this method existing buildings are not paid for and the city will not tear them down, but when a new building is erected, its front must conform to the new line. If, however, the city takes by condemnation the right to turn court-yard land into traffic-street land on or before twenty-five years without extra compensation, will not the condemnation lawyers see that the original award covers these future damages, and will not the awards be about as large as if the original taking was for complete street purposes?

But Mr. Swan is always incisive and practical. He would undoubtedly advise any state that sought to perfect the building-line method to study Massachusetts and Connecticut. In those states condemnation is not necessarily by court procedure, but a taking can be effected by notice and entry.

the building line, at some future time, into a street line. Normally, a second condemnation proceeding is required in order to include the land affected by the building line within the street lines. The suggested legislation eliminates this difficulty. In the second place, the law in some cities is so drawn that existing encroachments outside of the lines may be continued indefinitely; under the proposed legislation no encroachment projecting beyond the line would be permitted to remain more than 25 years. At the end of that time, or at any time before, if stipulated in the proceeding, the encumbrances outside the line would have to be removed.

Conservation of Building Values

Where building lines are established, existing buildings would generally be allowed to stay right where they are, on the understanding, however, that when they are rebuilt they will conform to the building lines. The establishment of building lines, therefore, will as a rule affect only the location of future buildings, so that when new buildings are erected they will be constructed in harmony with the requirements of the major street plan.

The establishment and maintenance of building lines is the most essential step in the realization of the major street plan. In widening streets a city could of course do so by setting back the street lines and demolishing any buildings within them. Although this would have the advantage of securing a street improvement at once, it would be needlessly expensive, as in many instances the improvement is not contemplated for the present, but for future traffic requirements. Street widenings through the condemnation of existing buildings invariably destroy rateables. In many instances the future well-being of the city will be just as well served through the establishment of building lines to which all new buildings have to conform, leaving present buildings to encroach beyond the lines until their reconstruction, demolition or the street widening becomes absolutely necessary. In this way present building values would be conserved at the same time that new building values would be developed in accordance with the plan.

If all buildings encroaching on the area within a new building line at the time of its establishment were to be demolished, the assessed valuation of the city would be diminished by the amount of their taxable value. Owners throughout the city would, in the absence of benefit assessments, be taxed to pay these damages. If benefit assessments were imposed, the value of these buildings would of course have to be included in the benefits assessed. In either case, property owners would have to be taxed in order to pay for the value of demolished structures. To permit these buildings to continue beyond the building line will enable the city to tax them as long as they stand. In this way these buildings, although ultimately removed, would themselves in the meantime help to carry out different phases of the thoroughfare plan. And, what is more, when demolished they would be demolished at the expense of the owners themselves and not at the expense of the city.

Practical Application of Building Lines

The establishment of building lines on a street is comparatively simple where all lots are of equal length and lie with their length normal to the street. In such cases, the proposed line affects all properties on the street substantially alike. The benefits and awards would probably equal each other for all of the respective owners; each owner would, in effect, bear his own award and pay his own benefit; no money at all would be passed between different owners. But all lots are not of equal length and their length is not always normal to the street. The establishment of a line in such cases introduces various inequalities between different property owners. They are therefore particularly difficult to handle in a satisfactory manner.

In the case of corner lots with their long dimension paralleling the street, the difficulty is especially great, as in such instances the establishment of a building line may make it impossible for an owner to build upon a considerable portion of his lot. There is a vast difference between the establishment of a building line that prevents buildings from encroaching upon the first 10 or 15 feet of a normal lot depth and the application of a line that prevents the use of from a fourth to a half of the lot width. Special consideration must be given to the establishment of such building lines.

Because of differences in the development on the two sides within the block, it will on some streets be impracticable to establish equal setback lines on both sides of the street; in such cases the line may have to be established farther back from the property line on one side of the street than on the other. In other instances, because buildings are set back a varying distance from the proposed line in different portions of the block, a diagonal building line may have to be established in order to conserve existing buildings.

In still other instances, one side of the street may be occupied by permanent improvements erected out to the property line, while the other side of the street is either vacant, improved with permanent buildings set more or less back from the property line, or occupied by obsolete buildings erected out to the property line. In such cases it may of course be impracticable to establish building lines that are set back an equal distance from the two respective property lines. Under such conditions the council may, in practice, be obliged either to establish building lines set back unequal distances from the property lines on the two respective sides of the street, or to establish a building line on only one side of the street.

Even as a result of these inequalities, it does not necessarily follow that the assessment for benefits should substantially exceed the awards. Existing facts as they apply on either side of the street must be carefully studied, and what is fair and just between different property owners must be determined upon the merits in each case. To offset benefits against damages so that each owner in actual fact defrays the cost of establishing the line on his own property will, wherever it is practicable, simplify the establishment of building lines. Owners must not view the establishment of building lines as a means of disposing of interests in their property at exorbitant figures, paid either by neighboring property owners or by the city at large. For them to do this will seriously compromise the usefulness of building lines as an intermediate means of ultimately securing wider streets. Owners must learn to cooperate with the city in the establishment of these lines. Otherwise the city will be utterly powerless to take constructive action looking toward a general widening of narrow streets.

Land Subdivision Control and Building Lines

Wherever property is unsubdivided on both sides of an existing road incorporated in the thoroughfare plan of a city, land subdivision control may be applied in such a manner that the desired width will be secured for the proposed major thoroughfare. Wherever the property on both sides of the street is subdivided, however, building lines may be applied on both sides of the street in such a manner as ultimately to secure the desired width for the thoroughfare. Wherever there is a stretch of street, however, flanked on one side by unsubdivided property and on the other side by subdivided property, control of land subdivisions may be applied on the unsubdivided side and building lines on the subdivided side, in a manner to secure the desired width for the thoroughfare.

It is thought that the application of both methods of control in cases of this sort will prove more agreeable to property owners than the application of building lines to both sides of the street. The owner of the unsubdivided land will plot the portion of the widened street on his property, usually one-half of the width of the proposed thoroughfare, on his subdivision map and dedicate it for street purposes. This will secure one-half of the desired widening. Building lines on the opposite side of the street will be laid down ultimately to secure the other part of the desired street widening. The owner who subdivides his land should be exempt from assessment on account of the building line on the opposite side of the street, as he takes care of his own side of the street through dedication of the area affected for street purposes. The assessment for the building line on the platted side of the street should therefore naturally be borne entirely by the owners of the platted land.

Building-Line Procedure

The establishment of building lines cannot, as a rule, be permitted to await petitions from property owners. There are so many building lines to be established in most cities that a more expeditious method must be worked out. To establish building lines on a block here and a block there is never going to get to the root of the matter. In most cities there are literally miles upon miles, in some cities hundreds of miles, of building lines to be established, so that the most efficient administrative machinery must be evolved to cope with the situation. The initiation of building-line proceedings can therefore not very well be left to property owners. The initiation of the proceedings should come from the city itself. But, of course, no line should be established until after a public hearing has been accorded property owners.

On all of the streets in the major thoroughfare plan upon which building lines should be established, it is suggested that the building lines be worked out through the agency of the planning commission. After the planning commission has held public hearings and secured the concurrence of property owners to the establishment of these lines, the matter should be taken up by the council. Whether or not the establishment of these lines should partake of the character of a court proceeding, as is now the case in condemnation proceedings in some cities, is a question. Unless the state constitution specifically requires this procedure, it is thought that more satisfactory results can be obtained if a small permanent board of appraisers can be constituted as the assessment commission to determine the assessments and awards. In many cities the board that assesses real property for taxation might serve the purpose.

The successful carrying-out of the major thoroughfare plan would undoubtedly be simplified and expedited by a permanent board. In many cities there are hundreds of streets that need widening. To appoint different appraisers for each project is exceedingly expensive. It places a premium upon inefficient and dilatory methods. The appointment of a permanent board of appraisers consisting of disinterested citizens qualified by knowledge and experience to determine such questions as may arise in the work enables the city to proceed in a businesslike manner in carrying out this big job. It also enables the city to cut red tape and to expedite what is even at best an intricate and technical procedure. Moreover, it is a big help to property owners who wish to know in the shortest possible time the exact intention of the city relative to their property.

Front Yards Established under Zoning Distinguished from Building Lines

Front yards and setbacks might be established, and in many instances are established, as part of a zoning ordinance. The courts have in various states upheld front yards established under the police power. Undoubtedly, such front yards should, as a rule, be established in every city. A zoning ordinance effectively controlling front yards and setbacks on all streets throughout the city is of inestimable value to the whole community. The advantage that such front yards have over building lines lies in the fact that they can be established on all streets throughout the entire city at one stroke by the adoption of the zoning ordinance; building lines, on the other hand, must be established one by one under the power of eminent domain, which necessitates the appraisal of damages and the assessment of benefits in each individual proceeding.

Under the circumstances, it may well be asked whether it is not futile to establish building lines when the enactment of a zoning ordinance is so much easier. The answer to this question is that there is need for both front yards and building lines. The adoption of zoning, valuable as it is in protecting front yards, does nevertheless not take the place of building lines established under the power of eminent domain.

Front yards established under zoning are usually designed to protect the amenities of a street or of a block with reference to the needs of its buildings for light, air, view, privacy from the publicity, commotion, dust, noise and fumes of the street, etc. It is difficult, if not impossible, to formulate the front-yard requirements in a zoning ordinance so that they will coincide with the widened street lines ultimately desired on a particular street to care for its present or future traffic requirements. Though the front yards provided under the zoning ordinance, if incorporated within the street, might in a given case afford a satisfactory street width, there is no certainty as to the result; the front yards may in some instances afford more space, and in other instances less space, than needed for the desired street widening. A building line would, on the other hand, be fixed in each instance by the requirements of ultimate street width. In other words, front yards laid down to protect the amenities of a district sometimes fail to care for its thoroughfare requirements.

Although front yards under zoning are a helpful auxiliary in the ultimate attainment of a thoroughfare plan, building lines must be relied upon to meet the many nice, detailed special requirements of different thoroughfares in the plan.

The front-yard requirements exacted under zoning vary, moreover, with different zones. This condition does not apply to all zoning ordinances. But in some cities there are as many different front-yard requirements as there are zones. Changing a one-family zone into an apartment or into a business zone might in such an instance be accompanied by a reduction in the front yard required, despite the fact that such a reduction might seriously prejudice the realization of the major thoroughfare plan. Such changes in zone, though in themselves probably most desirable, would have the evil effect of releasing front yards for building development at the very time when their maintenance would be most imperative in order to preserve the integrity of the major thoroughfare plan. Building lines established under the power of eminent domain nail down the prospective width of each street so that it is independent of zone changes.

Moreover, even after their establishment, front yards established under zoning are wholly within the control of the private owners. They still own the land and, if the city should at some future date desire to widen a street, it would have to acquire the land included within the front yards. In other words, whenever the city came around to a street-widening program, it would have to go through substantially the same procedure as is involved in the establishment of the building lines herein advocated. A zoning ordinance therefore does not obviate the necessity of establishing building lines or acquiring the required property under eminent domain, but it does prevent the encroachment of buildings upon established front-yard areas, and holds them vacant pending the acquirement of the required property under the power of eminent domain.

Building Lines in the Thoroughfare Plan

In carrying out the major thoroughfare plan, the average growing city must place its principal reliance on two measures—control of land subdivisions, and the establishment of building lines. Control over land subdivisions secures the new streets required in undeveloped sections. It also secures the widening of existing country roads to a width satisfactory for traffic thoroughfares incorporated in the plan. But the establishment of building lines must be relied upon in the main to secure the ultimate widening of existing, too narrow city streets.

In the successful achievement of a thoroughfare plan, an economical method of administering it has to be worked out so that its ultimate realization will involve a minimum cost to the city. If a plan is to be realized in its entirety, nearly its whole cost must be borne by benefited property owners.

Control over land subdivisions is effected through the police power. Land for the new or widened streets thus obtained would therefore be secured without cost to the public.

The building lines established with a view to their ultimately becoming street lines are, however, effected through an exercise of eminent domain. Although, technically speaking, compensation must be paid owners for the establishment of these lines, benefits equaling the awards should normally be assessed so that the owners in each block would generally defray the cost of establishing the lines. Practically then, a minimum burden would be thrown upon the city treasury. At least, this has been the experience of communities that have had considerable experience with the establishment of building lines.

A rational street plan must in many cities be developed by replanning the existing streets. Yet, to be carried out at all, this replanning must be undertaken in a gradual manner. To widen at once all the existing streets that are too narrow to care adequately for either present or prospective traffic demands would be equivalent to bankrupting both the property owner and the city. Such a foolhardy policy would never be seriously pursued. Yet, this is no reason why a beginning should not be made in the gradual widening of these streets. Up to the present time, but one method to effect this result economically has been formulated, and that is through the use of building lines.

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NEW YORK STATE HEALTH LEGISLATION OF 1931

AMONG a group of amendments to the Public Health Law of the state of New York passed by the 1931 Legislature, one of the most important is that which requires in cities of more than 50,000 population that local health officers hereafter appointed shall devote their full time to the duties of their office and "shall not engage in the practice of medicine." This is Chapter 473 of the Laws of 1931.

Another health bill which was passed provides for the establishment under the State Department of Health of three additional state hospitals for tuberculosis, and appropriates, by Chapter 481, $750,000 for the acquisition of sites and the construction of one such hospital.

Chapter 288 amends the Public Health Law by giving concurrent authority to a county board of health and a county health commissioner to investigate and abate public nuisances which may affect health. This amendment makes the machinery for nuisance abatement much more effective, as it is often difficult to arrange a meeting of a county board of health with despatch.

THOMAS PARRAN, JR., M.D.
State Commissioner of Health.

CONTACT RE-ESTABLISHED THROUGH THIS MAGAZINE

TO THE EDITOR:

Several years ago I saw a notice in the *Kiwanis Magazine* about a college classmate of mine, whom I had not heard from in several years. We re-established contact through that medium.

The April issue of THE AMERICAN CITY carried my picture among those of other City and County Engineers. Just yesterday I received a letter from another college-mate that I had not seen nor heard from for more than ten years. Little items of interest such as these make our jobs more enjoyable, and give us a change from the "pressure of police, construction and maintenance," as he expressed it. Thanks for using the picture, and for the renewal of an old contact through your interesting and useful magazine.

C. W. TEN EICK,
City Manager, Hollywood, Fla.

Brunswick, Ga., Installs Uniform Street Sanitation Record System

Wide Scope of Sanitation Activities Leads to Choice of This City for Demonstration

THE first complete installation of the record and cost accounting proposals of the Committee on Uniform Street Sanitation Records has just been made in Brunswick, Ga. Brunswick was selected by the Committee as a model city for demonstration purposes, after an extensive survey of cities in the 15,000 population class. The honor was accorded to Brunswick because that city is performing all types of activities, including street cleaning, the removal of garbage, trash, night soil and dead animals, incineration, dumping, catch-basin cleaning and other services included in the committee's program and usually supplied only in larger cities. Moreover, the methods employed by the city in administering these activities, together with the budget system, are of such character that an installation of the system could be made with relative ease.

Types of Reports and Forms Installed

The installation of the record and accounting systems include the following:

1. Daily field reports for all work performed and equipment used.

2. Equipment records showing the performance and costs of operating each piece of equipment.

3. Cost records by means of which the daily field reports, equipment records and other accounting forms can be compiled into total and unit costs of the work done.

4. A complaint procedure insuring that every complaint will be investigated with dispatch.

5. Monthly statements of work and costs of man-hour production, of services performed and of complaints; showing in each case how accomplishment compares with the predetermined standard.

Information under the five headings above is shown and brought out in tabular form in the accompanying statistical forms, "Comparative Work and Cost Statement for Street and Sanitation Department" and "Analysis of Complaints and Special Requests for Service."

Standard Work Units Employed

The system installed in Brunswick employs the work units which the Committee on Uniform Street Sanitation Records has established for standard use throughout the country. The work units tested in this installation are:

1. *Street cleaning*—the "cleaning mile"; that is, a mile of street cleaned once by beat patrol and machine sweeping, which are the only methods employed. The same unit is also applicable to broom gangs, machine flushing and hose cleaning.

2. *Street sweepings removal*—(a) "cubic yards of sweepings removed" and (b) "cubic yards removed per cleaning mile."

3. *Catch-basin cleaning*—(a) "cubic yards of cleanings removed" and (b) "number of catch-basins cleaned."

SCHEDULE A—WORK PROGRAM FOR 1931

Brunswick, Georgia

Operations (1)	Standard Units Employed (2)	Total No. Work Units (3)	Unit Cost Standard (4)	Total Cost (5)	January (6)		February (7)		March (8)		April (9)		May (10)	
					No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost
1. Refuse removal	Cubic yds.	55,000	.30	$16,500	4,500	1,350	4,000	1,200	4,200	1,260	4,800	1,440	5,000	1,500
2. Night soil removal	"	1,335	1.50	2,002	125	187	110	165	100	150	125	188	125	188
3. Incineration	"	10,600	.15	1,590	900	135	800	120	900	135	1,000	150	900	135
4. Dumping	"	45,535	.04	1,829	3,725	149	3,310	132	3,400	136	3,925	157	4,225	169
5. Machine sweeping	Clng. mile	1,105	1.00	1,105	110	110	100	100	100	100	100	100	100	100
6. Beat patrol	"	2,880	.40	1,152	240	96	240	96	240	96	240	96	240	96
7. Sweeping removals	Cubic yards	941	.15	141	100	15	100	15	100	15	90	13	90	12
8. Catch-basin cleaning	"	400	1.00	400							200	200		

	June (11)		July (12)		August (13)		September (14)		October (15)		November (16)		December (17)	
	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost	No. Work Units	Cost
1. Refuse removal	4,500	1,350	5,500	1,650	5,000	1,500	4,000	1,200	5,000	1,500	4,000	1,200	4,500	1,350
2. Night soil removal	100	150	125	187	100	150	100	150	100	150	100	150	125	187
3. Incineration	900	135	900	135	900	135	800	120	900	135	800	120	900	135
4. Dumping	3,700	148	4,725	189	4,200	168	3,300	132	4,200	168	3,300	132	3,725	149
5. Machine sweeping	85	85	85	85	85	85	85	85	85	85	85	85	85	85
6. Beat patrol	240	96	240	96	240	96	240	96	240	96	240	96	240	96
7. Sweeping removal	80	12	70	10	70	10	60	9	60	9	60	9	60	9
8. Catch-basin cleaning			100	100					100	100				

COMPARATIVE WORK AND COST STATEMENT FOR STREET AND SANITATION DEPARTMENTS
City of Brunswick

For Month Ending ..... 193..

Operation (1)	Work Units (2)	Units of Work Done			Unit Cost			Total Cost		
		Actual Work (3)	Work Program Estimate (4)	Difference (5)	Actual (6)	Unit Cost Standard (7)	Difference (8)	Actual (9)	Work Program Estimate (10)	Difference (11)
SANITARY DEPARTMENT										
Refuse removal	Cubic yds.									
Night soil removal	"									
Incineration	"									
Dump disposal	"									
Sanitary Dept. totals										
STREETS AND DRAINS										
Machine sweeping	Cleaning miles									
Beat patrol	"									
Sweepings removal	Cu. yds. cl. miles									
Street const. and cleaning	Miles									
Street grading	"									
Street repairing	Square yds.									
Sewer work	Lineal ft.									
Catch-basin cleaning	No. basins, cu. yds.									
Ditching	Lineal ft.									
Streets and drains totals										

4. *Garbage and trash removal*—"cubic yards removed." Tons removed is a supplementary unit when weights can be made of each load.

5. *Night soil removal*—"cubic yards removed."

6. *Dead animals removed*—"number of animals" of the following classifications: dogs, cats, chickens, goats, hogs and cattle.

7. *Refuse removal*—"cubic yards" and "tons" as in removal.

Work Program and Unit Cost Standards

A work program for the entire year was prepared for each of the above activities and is outlined on schedule A. This work program shows the total work for each operation to be done during the year expressed in terms of work units, unit cost standards, and total costs. The amount of work to be done was based on an analysis of the existing schedule of operation and the estimates of the city manager and street and sanitation superintendents. The schedules of sizes of routes and frequency of work therefore support the comparative work and cost statement.

The unit cost standards represent the minimum unit cost at which Brunswick may be expected to perform its work. Thus, they may serve the officials of Brunswick as a standard throughout the entire year to guide them in evaluating actual performance. It was necessary to post all of the records from January 1 to the time of the installation in order to set up these unit cost standards. The total costs on the work program were then computed by multiplying the unit cost standards by the amount of work to be done. Ordinarily, many of the unit cost standards should vary from month to month, but the system must operate a year or two before such refinements can be attained.

During the course of the year a monthly work and cost statement will indicate whether the work program is being complied with and the extent to which actual unit costs conform to the unit cost standards. This monthly comparative work and cost statement provides the city manager and the street sanitation officials with a control over each of the operations listed. If the work or unit costs do not conform to the estimates and standards, the detailed cost records are analyzed to determine the cause therefor. The schedules of work or methods can then be revised on the basis of the facts provided by this analytical information.

Control Over Complaints and Special Services

To improve the method of handling citizens' complaints and requests for special services, a new complaint record was installed. This record provides the name and address

ANALYSIS OF COMPLAINTS AND SPECIAL REQUESTS FOR SERVICE

City of Brunswick
Sanitary Department

For Month of ..... 193..

NATURE OF COMPLAINT

1. Failure to collect refuse _____
2. Careless or unsanitary handling _____
3. Discourteous acts by collector _____
4. Personal property taken by collector _____
5. Other _____
Total _____

SPECIAL COLLECTIONS REQUESTED

1. Garbage _____
2. Trash _____
3. Ashes _____
4. Dead animals _____
5. Other _____
Total _____

RESULTS OF INVESTIGATION

JUSTIFIED COMPLAINTS

1. Collector failed to stop _____
2. Refuse not properly removed _____
3. Collector discourteous _____
4. Collector took property not on refuse pile _____
5. Other justified causes _____
Total _____

UNJUSTIFIED COMPLAINTS

6. Refuse improperly located _____
7. False complaint _____
8. Property carelessly left on refuse pile _____
9. Proved to be request for special collection _____
10. Other unjustified causes _____
Total unjustified complaints _____
Total complaint investigations _____

COMPARISON COMPLAINT	This Month	Last Month	This Year	Last Year
Justified				
Unjustified				
Total				

of the complainant and spaces for checking the type of complaint or the type of special service, as is shown on the form, "Analysis of Complaints and Special Requests for Service."

The individual form is printed in duplicate, the first copy being given to the investigator and the second remaining in the office as a control. If it is a citizen's complaint, the investigator states in detail, in the space provided, who was at fault and the action taken.

At the end of the month, these complaint records will be compiled and entered on the Analysis of Complaints and Special Requests for Service. This analysis not only separates the special services from actual complaints, but shows the causes of complaints and whether they are justified. With this analysis at hand, the officials will have a barometer of citizen satisfaction with their work and will be able to identify the causes of complaints.

After completing the Brunswick installation and remaining until every phase of it was tested, the staff of the Committee on Uniform Street Sanitation Records conferred with the officials at Charlotte, N. C. Although time did not permit the installation of the system while the staff was there, all forms and instructions necessary for the installation were prepared. The next complete installations will be made in Kenosha, Wis., and Troy, N. Y. The installation cities in the population classes of 150,000 and 500,000 will be selected later. Any inquiries concerning this work should be directed to the Committee on Uniform Street Sanitation Records, 923 East 60th Street, Chicago, Ill.

Methods of Chlorination at Small Water Works to Handle Population Peaks

By **J. H. MILLER**
Supervising Chemist, Sandusky, Ohio

STERILIZATION of the water supply of very small communities sometimes presents a considerable problem which is not present in larger municipalities where the cost of equipment and trained superintendence represents a relatively low burden when spread over a heavy daily gallonage. At Beulah Beach, Ohio, normally a community of only 100 residents, this problem has been satisfactorily solved without any investment in equipment or specially trained personnel. Beulah Beach, located on Lake Erie, is the site of the annual meeting of the Christian Missionary Alliance. During this meeting the population jumps for a short period to 5,000. Lake Erie is the source of water supply and is known to be contaminated. The maximum pumpage is 25,000 gallons daily, and the average pumpage 6,000 gallons.

Owing to the small size of the plant, its operation is given over to a student, consulting service being given by the writer. Under such conditions a very simple and economical method of chlorination is essential. HTH, a product of the Mathieson Alkali Works, has been found well suited in practice to these conditions. It is a concentrated chlorine carrier containing 65 per cent available chlorine. In the form of a free-flowing stable powder, it is packed in ordinary cans which may be stored without loss. It is easily measured and applied, and is quite readily soluble in cold water.

At the Beulah Beach plant the practice has been to dissolve the requisite quantity of the hypochlorite in a barrel of water and apply it by means of a drip feed to the filter effluent as it enters the clear well. Owing to the stability of the solution, it is not necessary to make up fresh solution more often than once a week. In the quantities used, there is little or no sludge and no floating scum or insoluble matter in the solution.

The operators have been easily trained to regulate the drip feed and check the chlorine residual by means of a comparator. Since using this method, there has been no interruption of chlorination, and the finished water has always been sterile. The cost of chlorination has been $4.77 per million gallons, the daily cost on the small gallonage being almost negligible.

The success of HTH as applied to this problem has led the writer to consider its application in the sterilization of new reservoirs, storage tanks, pipe lines and emergency water supplies; small-scale control of sewage odors and effluents; controls of moulds and algae; and swimming pool sterilization.

Digging Gold in Denver

FOR several years Denver, Colo., has had crews from the Highway Department constantly at work on the channel of the Platte River, widening, straightening and deepening it within the city limits, to prevent damage by flood waters. As a rule, the bedrock is shallow in the bed of the river, and the big drag lines are followed by a horde of treasure seekers, washing out yellow gold dust such as caused the birth of the city in 1858 and 1859. Armed with light wooden sluice-boxes, with wood or metal riffles, and gold-pans, a heterogeneous crew of gold diggers, male and female, young and old, dig up the stream bed in the wake of the machines.

In building a concrete apron and reinforcing a diversion dam near Santa Fe Drive, and at the same time deepening the channel below, a greater part of the river flow was turned out in a canal, giving the unemployed of the city a fair chance at the treasure in the stream. It is first come, first served, and he who is lucky may go home at night with an ounce or two of gold dust, if he strikes a good pot-hole or crevice in the bedrock. If he cannot work it out the same day, he usually stands guard throughout the night, or someone else will be on the job the next morning.

JOS. C. COYLE.

A Complete Treatment of Sewage from Packing-Houses by Superchlorination

By **H. O. HALVORSON**
Department of Bacteriology and Immunology, University of Minnesota

THE use of chlorine for the precipitation of proteins from sewage is not only a new application of chlorine, but also a new departure in sewage treatment. Although the method is not economically suited for domestic sewage, it is specifically adapted for the purification of certain industrial wastes, and should therefore be of interest to sewage treatment works operators.

The first installation to employ this principle is the sewage disposal plant installed at the Geo. A. Hormel Packing Co., of Austin, Minn. A brief description of this plant will serve to explain the process.

The Austin Plant

Prior to the installation of the treatment plant, the packing house at Austin produced 1½ million gallons of sewage per day which was about six times as strong as the average domestic sewage. By segregating the clean water from the actual waste, the volume of sewage was decreased to 750,000 gallons per day. This waste is now about twelve times as strong as domestic sewage. Such a concentration of the waste is desirable in order to make the treatment self-supporting.

The raw sewage first enters a small grit chamber where sand, gravel, etc., is removed. From here it flows into a sedimentation chamber, where the fat rises to the surface and the heavy solids settle. The fat is skimmed off and recovered for soap stock, and the sludge which settles is concentrated and removed with the aid of a Dorr clarifier and diaphragm pump. The effluent from this chamber flows into a mixing tank, where it is treated with just enough chlorine to cause the proteins to curdle. From here it enters a second mixing tank, which discharges into the second settling chamber. The mixing chambers are of such capacity as to provide a detention of twenty to thirty minutes. Agitation for this length of time is essential for a thorough reaction between the sewage and the chlorine. The mixing allows the escape of gases liberated in the treatment, which, unless removed, will prevent the settling of the sludge.

The results of the chlorine treatment can be observed in the photographs of the cylinders. Cylinder No. I contains raw untreated sewage; No. II contains a sample of the same sewage treated with chlorine and allowed to settle after a twenty-minute mixing period. In cylinder No. III there is a sample of the effluent from the treated sewage, and in No. IV, a sample of drinking water. The similarity between III and IV serves to illustrate the remarkable clarification obtained with this treatment.

The second settling chamber, which receives the treated sewage, is designed to give a detention of three hours, while the primary clarifier need have a detention of only twenty to thirty minutes. The sludge settling to the bottom of the secondary clarifier is concentrated and removed in the same manner as the primary sludge. The two sludges are mixed prior to filtering and drying, which is accomplished by means of a Dorrco vacuum filter and a rotary tankage drier.

In addition to the fats, 5 tons of dry sludge is obtained daily when the packing plant operates at normal capacity. The tankage thus obtained has an ammonia content high enough to make its market value as feeding tankage sufficient to cover all operating costs.

Costs

Owing to its simplicity of construction, the installation cost is very low. The entire plant can be inclosed in an area less than 90 feet square. The clarifiers need not be covered, since fresh packing-house sewage has sufficient heat to prevent freezing in winter. A small building is necessary for the chlorinating equipment. This is built over the mixing chambers, so that it houses the agitation motors as well as the sludge pumps.

The plant has not been operating long enough to allow the compilation of accurate cost data, but a fair estimate is given below:

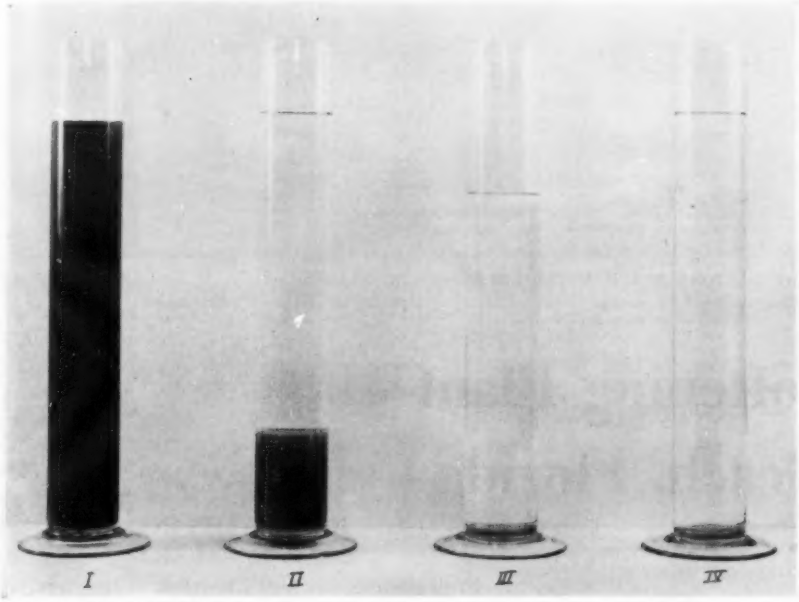
	Per Day
Power	$16.00
Labor	9.30
Chlorine (1,500 lbs. at 2.3c per lb.)	34.50
Sludge (dewatering and drying) Labor, steam, power, conditioner.	45.15
Milling of tankage	9.25
Interest and depreciation 12% on $70,000	28.00
	$142.20

THE PLANT WHERE SUPERCHLORINATION HAS DEMONSTRATED ITS SOLUTION OF THE PACKING-HOUSE WASTE DISPOSAL PROBLEM

Under normal conditions and when sufficient feeding experiments have been completed, the company expects to be able to market the sludge at $30 per ton. The 5 tons of sludge will therefore have sufficient value to make the plant self-supporting. In addition, some profit will be derived from the fats.

Advantages of the New Method of Treatment

The plant has now been in operation for a period of six months, and during this time a remarkable change has taken place in the Cedar River, which has been receiving the packing-house sewage. Prior to the treatment, the stream was no better than an open sewer. The odor was very objectionable, and a large amount of sludge was seen floating on the surface. Now there is no odor, and no floating sludge, and the water is as clear as unpolluted river water.



A DEMONSTRATION OF THE EFFECTIVENESS OF THE CHLORINE TREATMENT OF PACKING-HOUSE WASTE

Cylinder I contains raw untreated sewage. Cylinder II contains the same sewage treated with chlorine and allowed to settle after a 20-minute mixing period. Cylinder III is the effluent from the treated sewage. Cylinder IV is a sample of drinking water for comparison

If a little care is exercised in controlling the process, there is comparatively little free chlorine in the effluent, so that no harmful effects are produced by discharging it directly into the stream. Where it is possible to mix packing-house waste and domestic sewage, an effluent of this type should be particularly desirable, since the available chlorine present in the treated packing-house effluent would serve to control odors and produce the other advantages for which chlorine is now extensively used. This process not only provides an economical method of treating packing-house sewage, but serves to control packing-house odors. Following the installation of this process, the usual packing-house odors have completely disappeared from Austin. Apparently they are counteracted by the faint chlorine odor near the plant.

The separate treatment of packing-house sewage by a process of this type is economically practical. It is much cheaper to treat the waste separately in this manner than it is to treat it by biological methods either separately or mixed with domestic sewage. Investigations on the sewage of the Geo. A. Hormel Co. plant showed that it would cost about $150,000 to install a biological treatment plant, and that the yearly operating costs would be between $35,000 and $40,000. When municipalities must treat both domestic and packing-house wastes, the adaptability of this process should be carefully investigated.

Public Health Inadequately Financed

THE disproportionately small amount which the people of a great city spend on public health as compared with payments to private practitioners and hospitals is indicated in a recent publication of the Committee on the Costs of Medical Care. This organization, formed to study the economic aspects of the prevention and care of sickness, including the adequacy, availability, and compensation of the persons and agencies concerned, has its headquarters at 910 Seventeenth Street, N. W., Washington, D. C. The following paragraphs are taken from the digest made by the Committee on the Costs of Medical Care, of its Philadelphia hospital and health survey:

"*Costs.*—Philadelphia's people spent for medical care, directly and indirectly, an estimated total of nearly $104,000,000 in 1928—$53.89 per capita. (The latter figure may be somewhat excessive because of expenditures in the city by non-residents.)

"For what services is this $53.89 spent? Forty-five per cent of it ($24.40 per capita) goes for the services rendered by various private practitioners—26 per cent to physicians, 13 per cent to dentists, nearly 4 per cent to nurses, 1 per cent to osteopaths, and nearly 2 per cent to other private practitioners. Hospitals and sanatoria cost nearly 27 per cent of the total, $14.54 per capita, when such indirect charges as interest, depreciation, tax exemption, and endowment accretions are included. Drugs and medicines consumed 20 per cent, or $10.96 per capita. Indirect expenditures through the state departments of health and welfare account for 2 per cent, $1.25 per capita. Local public health expenditures constitute but 2 per cent of the total, or $1.02 per capita. Miscellaneous expenditures are 3 per cent. . . .

"An appraisal of Philadelphia's public health activities, according to the American Public Health Association standards, gives a total weighted score of 73.8 (on the basis of 100). The city makes high scores in the fields of maternity hygiene, communicable disease control, heart disease control, and infant hygiene, but low scores for sanitation (including the provision of potable water and the sanitary disposal of sewage), pre-school hygiene, cancer control, venereal disease control, and school hygiene.

"The city's hospital facilities have apparently developed without effective community planning."

VIEW OF THE DAYTONA BEACH MAINLAND SOFTENING PLANT
Showing the softening and coagulating basins, lime storage house, laboratory and partial view of main pump station and superintendent's residence

The Water-Softening Plant at Daytona Beach, Florida

By **B. F. TIPPINS**
and F. E. STUART
Superintendent and Chemist, respectively, Daytona Beach Water Works

DAYTONA BEACH was the first Florida city to own and operate a water-softening plant for domestic purposes. The original warte works was designed and built in 1908 by C. M. Rogers, consulting engineer, of this city. The first unit of the softening plant was built in 1910 by the city, and successive units were added as required.

Boom days hastened the consolidation of three small towns into the city of Daytona Beach with a population of 25,000 and owning three separate water-softening plants, all of different types.

Source of Supply

The source of the supply for Daytona Beach is artesian wells. There are seventeen 6-inch wells varying in depth from 180 to 240 feet and having an approximate head of 6 feet above sea level, which is taken down to approximately 5 feet below by heavy loads. A contemplated new plant for the entire city will be built on the mainland with several lines leading across the river to elevated storage tanks. The length of the peninsula requires the use of two such tanks to keep a sufficient constant pressure in the outlying districts.

Water is brought to the aerators by centrifugal pumps, varying in size from 4 inches to 10 inches, with capacities of 700 to 3,400 gallons per unit. The wells have a good supply at all seasons.

VIEW OF THE RAW WATER BEING AERATED AT THE RATE OF 800 GALLONS PER MINUTE AT THE PENINSULA PLANT

Chemicals Used in Softening

Lime-soda treatment is used at all the softening plants. Other methods have been tried, but, owing to the high cost, have been discontinued. The water is so hard and has such a high mineral content that the use of 16 grains per gallon of lime is required at one of the plants.

The treated water delivered to the city mains in 1929 totaled 524,929,000 gallons, or an average daily pumping rate of 1,438,000 gallons. The per capita consumption was 67 gallons daily.

QUANTITIES OF CHEMICALS USED PER YEAR

Lime	998,902
Alum	53,127
Soda ash	31,475
Amount per gallon in parts per million:	
Lime	208
Alum	11.9
Soda ash	6.8

The treated water is delivered to domestic customers at 20 cents a thousand gallons, and costs, above all overhead, 10½ cents to pump, treat and deliver to the consumer.

The water works has experimented with all well-known makes of softening reagents and has concluded that the lime-soda-alum treatment is about the cheapest satisfactory method of softening. There are several methods that will give equal or better results, but their cost is prohibitive.

The Softening Process

The softening system of the mainland station is intermittent, while that on the peninsula is continuous. Water on the mainland is pumped through an aerator located about 4 feet above a 75,000-gallon reservoir. The water falls over a splash-board into a series of baffle-plates, causing a fine spray which releases sulphuretted hydrogen into the air.

When the reservoir becomes filled, an air agitation system, consisting of a network of perforated pipe, is turned on. This method of agitation is used because it was original equipment, although mechanical agitation is considered better. The new plant will have mechanical agitators and recarbonating equipment. When air pressure has the entire body of water in motion, the milk of lime-soda solution is added, and agitation is continued for about 20 minutes. Then powdered alum is scattered on the surface and allowed about three minutes to mix into the solution. Too much agitation after application of the coagulant will break up the floc and delay the settling. Less than five hours after treatment starts, including a settling period, the treated water is ready to be delivered to the mains by an original decantation process used in emptying the reservoirs. There are nine tanks similar to the one described, in which treatment is identical. They are used in rotation and become "ground storage" as long as they are not being used for treatment, providing a total of 675,000 gallons of water in reserve in case of unusual demand. The clear-well storage and pump has a capacity of 60,000 gallons additional.

In the continuous lime-treating process employed in the peninsula plant, water flows to centrifugal pumps located in a low-head pump house which was specially constructed for the conditions encountered with a water table 6 feet from the surface. This concrete well-pit was built to house the raw-water pump and manifold located 8 feet below the surface. In this installation there is no need of priming the pumps.

PENINSULA STATION PLANT NO. 3

This plant is equipped with a diesel engine which is used in case of electrical disturbance. The process of treatment is intermittent. The illustration shows the pump house, clear well and coagulating basins

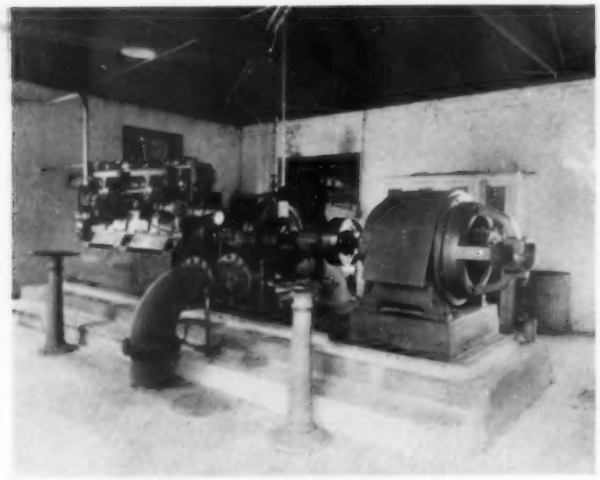
Seven 6-inch wells connect directly to a large manifold so designed and constructed that any portion of the well system may be shut off without altering the operation of the plant. The well pumps operate under a head of 70 feet, delivering to aerators where the water falls into a "downtake." Here the lime-soda solution, pumped from the chemical house, is applied. The alum solution enters this same downtake in dilute solution and under pressure.

The water enters pressure filters which have a combined capacity of 1,200 gallons per minute and then flows to the ground-water storage reservoir, which has a total capacity of 410,000 gallons. From this reservoir, the water is pumped to the city distribution system by three high-pressure pumps, varying in size from 400 to 800 gallons per minute, all electrically operated by Cutler-Hammer control.

There is elevated storage on the peninsula in two tanks with a total capacity of 135,000 gallons, 75,000 gallons on the mainland, giving a total elevated storage capacity for the city of 210,000 gallons, which will maintain a normal pressure of 55 pounds. The total elevated storage capacity for the entire city is handled by a Chicago, a Cole and a Schofield tank.

VIEW OF THE WATER-SOFTENING TANK, SHOWING MIXING EFFECTED THROUGH AGITATION WITH AIR

Note the decantation dipper floating entirely out of the water while the treatment is under way



A CAMERON CENTRIFUGAL PUMP CONNECTED FOR OPERATION BY A STERLING 300-HORSEPOWER GAS ENGINE OR BY A 200-HORSEPOWER GENERAL ELECTRIC MOTOR

Record of Operations Since Establishment of the Chemical Control Laboratory

A chemical control laboratory was established at the Daytona Beach water works in 1927. Since that time remarkable savings have been effected in the use of chemicals. At a 75-000-gallon rate, prior to 1927, it was costing $3.53 for chemicals to treat a water of 340 parts per million hardness to a satisfactory degree for service, namely, between 95 and 130 parts per million. By close chemical control, by the end of 1927, it was costing $1.20 for the same results at the same rate of treatment. The comparative tables below show the cost of the old and new methods for plant No. 1:

	New Methods Cost	Old Methods Cost
288,098,000 gallons in 1928	$4,609.20	$13,558.73
259,771,000 gallons in 1929	4,155.60	12,224.39
547,869,000	$8,764.80	$25,783.12
		8,764.80
Total saving in chemicals		$17,018.32
Total cost of personnel for laboratory		3,240.00
Total saving since establishment of control laboratory, including salary of chemist		$13,778.32
Verification of the above figures:		
Budget appropriation 1927 for chemicals		$20,372.00
" " 1928 " "		6,842.02
" " 1929 " "		8,617.23
" " 1930 " "		8,758.00

Distribution System

There are 64 miles of cast iron water main varying in size from 4 inches to 16 inches in the distribution system. There are 464 hydrants and 612 valves, giving an average of 7 hydrants and 9 valves to the mile. There are 4,850 services varying in size from ¾-inch to 6-inch. The sprinkler connections for fire prevention number 23. All the services are metered, giving an accurate estimate for total revenue. Approximately 80 per cent of all water pumped is accounted for in cash. The hydrants used for construction purposes are equipped with special meter attachments.

All tests made on the water meters show they are very accurate, varying less than 2 per cent on the average. As a general rule, they are about 1½ per cent slow. The meters are of the disc type with enclosed gear trains for small services, and compound meters are used for the large services. No cross-connections are permitted in the distribution system. Hot-water service connections are required to have a check valve and a relief valve.

The services are brought to the curbs in cast iron meter boxes and equipped with curb cocks and service valves.

HARDNESS OF THE RAW AND TREATED WATER IN PARTS PER MILLION

	Raw Water	Treated Water
pH index	7.4	8.4
Total hardness	340	119
Carbonate hardness	300	70
Non-carbonate hardness	40	49
Bicarbonate, Ca and Mg	300	26
Nor. carbonates, Ca and Mg	...	44
Nor. carbonates, Na_2 and Co_3	...	00
Caustic alkalinity as Ca $(HO)_2$	...	00
Caustic alkalinity as Na OH	...	00
Total chlorides	170	170

The odor of the raw water is caused by compounds of sulphur in solution, which can be released entirely by aeration and other treatment.

Bacterial Count Low

The raw water is clear and bacterially safe. The only case of contamination in the treated water was in the summer of 1928 when a high count and slight fermentation caused uneasiness. This was traced to the use of a section of fire hose which the street department had employed to flush a storm sewer without the knowledge of the water department. Removal of this hose and a thorough cleaning of equipment remedied the matter, and no such experience has occurred since then.

The average bacterial count for the raw water for 1929 was 60 bacteria per cubic centimeter, and there were no colon organisms present. The average bacterial count for the treated water for 1929 was 20 bacteria per cubic centimeter, and color organisms have never been found in the lime-treated water.

Very few cases of typhoid are reported in this section and they are readily traced to contaminated oysters. Owing to the strict enforcement of sanitary laws by the States Board of Health, in regulating oyster handling, no typhoid from this source occurred during 1930.

The water works has its own chemical and bacteriological laboratory, which is essential to proper control of a modern water plant. The entire softening system functions through this laboratory at all times in a positively controlled and satisfactory manner. Experience at Daytona Beach has shown that laboratory supervision and rigid control have effected pronounced saving in the operation of its water works, besides assuring efficiency of service under the highest sanitary conditions.

IMPORTANT PLANNING CONFERENCE

ENGINEERS, zoning administrators, municipal officials and other attending the 234 annual meeting of the National Conference on City Planning at Rochester, N. Y., June 22-24, inclusive, will find emphasis placed on experience rather than theory in the program. City traffic, special assessments in city planning, master plans and official maps, and the avoidance of blighted areas adjacent to traffic ways, are among the subjects to be presented for discussion. The Conference becomes increasingly a forum for the exchange of experience on the scientific physical development of American cities.

The Place of Humor in Advertising Water Works

Prominent Water Works Company Develops Interesting A to Z Series for Use in Local Papers

ONE of the duties of the Department of Information of the New York office of the American Water Works & Electric Co., Inc., is to assist its local plants in the preparation of advertising for use in the various city publications. For many years neat and dignified copy has been produced and forwarded to the various companies for their use. To customers who read these advertisements, there was carried a message regarding the business of the company, a message which would give them a better understanding of the problems of the water works and the magnitude of its operation in furnishing a pure supply of water.

In the quest for "attention value," that invaluable quality of advertising which leads you to read it, came an idea that a new angle of approach might be used. Why not write some advertising from a humorous angle, employing the use of a striking, yet amusing, illustration? A great deal of time and energy was expended and, as the Department of Information records, "Brains creaked, waste paper baskets became full of foolscap; finally, the so-called 'A to Z' series of advertisements resulted." This series of advertisements, some of which are reproduced on the two succeeding pages, was passed upon by the executives of the company and approved.

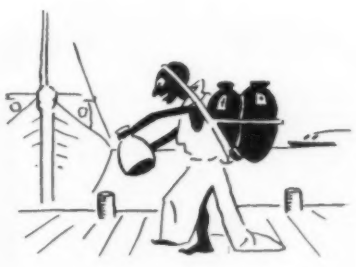
Dignity versus Humor in Advertising

The average water-works man rightfully takes his work very seriously and with a great deal of dignity. Upon his shoulders rests a tremendous responsibility for the health of the community and for the delivery of a water which will have the proper characteristics to insure successful operation of industrial and chemical processes. No one can carry these responsibilities on his shoulders and look upon the operation of his water works as a joke, but let us translate this into publicity form and see how it will normally affect the average reader of a newspaper, who has no particular interest in his local water works, unless the water suddenly becomes dirty or pressure fails and there is no water on the second floor of the house.

Mr. Average Consumer picks up his *Evening Bugle*, glances through the spicy local news, sees the notice of the Strawberry Festival and then, by chance, happens to see the small advertisement which the local water department or water company has inserted. The advertisement says, "Your Local Water Works Furnishes Pure Water 365 Days a Year at Adequate Pressure. Don't Waste Water, but Use All You Need for the Health of Your Family, Lawn and Garden."

Immediately, Mr. A. C. recalls that Thursday afternoon three years ago when the water was terribly muddy and, being of a somewhat slangy turn of mind, says, "Oh, yeah?" but he fails to recall that that particular Thursday afternoon was the one on which the lumber mill on Front Street burned down and there was a very heavy draft on the water works, which, naturally, stirred up any sediment that might have been deposited in the mains. He also fails to recall the battle the employees of the local water works put up when the river was high and threatened to flood out the boiler room. They worked in relays of twenty-four hours each for six consecutive days piling sand bags and tending small pumps which took care of the leakage through the dikes.

Now, let us consider the humorous advertisement such as the one shown above. After reading the Strawberry Festival notice, Mr. A. C. chances to see the more-than-usually clothed figure of a near-relative of Mahatma Gandhi, and immediately a grin spreads over his face. He then reads the verse about the Arabian port and thinks that it would be mighty tough to have to buy water by the pint or quart, while right at home all he has to do is to turn the handle of the faucet and get all the water he wants for less than 5 cents a day.



"M" is for Mocha
An Arabian port
Where water is sold
By the pint or the quart.

But here in this city
It's not scarce at all,
There's as much as you want
And right at your call.

It is the peculiar psychology of our minds that, having read something humorous, we do not immediately laugh at the associated idea, which in this case is the local water utility. Instead, Mr. A. C. takes a very friendly attitude toward the water works and not only thinks some very nice things about its operation, but recalls that the water in Hometown tastes a whole lot better than that in Bigtown, which he visited two weeks ago. It must be that they take a lot better care of the water and don't "dump" as much chemical into it as they do in other places.

"A" stands for Africa,
Hottest of spots,
Where water is scarce
And carried in pots!
But here in this city,
We're happy to say,
There's all that you want
For a few cents a day.
"B" is for Bulgaria
Where Bulgars do dwell—
For water depending
On uncovered well.
But here in this City
We're happy to think
It's piped to your home
And ready to drink.
"C" is for China,
Land of the East,
Where any old water
Suits the man and the beast.
But here in this city,
By day and by night,
The water is filtered
And made quite all right.
"D" stands for desert
Where Achmud the sheik's
Throat grows so dry
When he talks that it squeaks.
But here in our city,
When thirsty you grow,
There's always cool water
At hand, as you know.
"F" is for Fiji
Where cannibals roam
And very little water
Is piped to the home.
But here in this city,
As you very well know,
A turn of the tap
Gives an unending flow.
"H" is for Hawaii
Where Hula girls sway,
And water is furnished
Most any old way.
But here in this city
It's not quite the same,
For the water plant's service
Is worthy of fame.
"I" is for India
Where large snakes do creep.
The lack of cool water
Would make a man weep.
But here in this city
A cool drink is at hand,
And tasty as well;
It's the best in the land!
"J" is for Japan
Where 'quakes shake the nation.
Here most baths are taken
As per illustration.
But here in this city
No time need be killed;
A turn of the tap
And the bathtub is filled.

Pages from a Series of Advertisements Prepared by the Department of Information

"L" is for Lapland
Where ice is so thick
To reach streams of water
One must use a pick.
But here in this city
When water's requested
It's always at hand
And besides, it's been tested.
"N" stands for Nubia
Where winds make the sand fly
And travelers have fear
For their water supply.
But here in this city
Your supply is O. K.
In all sorts of weather,
All night and all day.
"Q" is for Quixote
That old Spanish knight;
Charging at windmills
Was his greatest delight.
If he'd taken more baths
And swallowed less rum
We feel almost certain
He'd not been so dumb.
"S" stands for Siam
Where Siamese twins
Throw trash in the rivers
And fish with bent pins.
But here with our Company
It's easily proved
That fish and impurities
Have all been removed.
"U" is for unwary
People who think
That untested water
Is quite fit to drink
Sometimes it's good,
Sometimes it's bad,
Drink pure city water
And never be sad.
"W" is for wise
People who bottle
Pure city water
Before opening the throttle.
The trip will be joyful
And father will wink
When baby gets thirsty
And cries for a drink.
"Y" is for Yaks
Who live in Tibet.
*One drink twice a year
Is all that they get.
Be glad that you live here
Without any law ter
Limit your drinks
As long as they're water.
*Estimated
"Z" stands for Zulu
Who paints up his face.
The water he drinks
Is from any old place.
But we are so careful
We always make sure
That the water we sell you
Is constantly pure.

of the American Water Works and Electric Company. Reproduced by Permission

Does It Pay to Advertise?

The privately owned water utility has probably more reason to advertise than a municipal water works. Some people cannot understand why a water works should advertise anyway, as everybody must use water. There are two distinct reasons why a water utility, privately or municipally owned, should advertise. First, as a means of maintaining good-will and recalling the utility to the minds of the consumer at times other than when a bill is presented or there is some slight trouble which might cause a complaint. The friendly attitude of the consumer toward the utility smooths the road toward the necessary bond issue, the time for voting which may be approaching in the case of the municipally owned water works, or the sale of the local water-works company bonds for expansion of the local plant in the case of the privately owned utility.

The second reason for advertising is to bring about a legitimate increase in the use of water in cases where a definite investment has been necessary to secure an enlarged supply which is larger than is needed by the community at the present time. Perhaps a 25 per cent increase in the use of water would be possible without any appreciable added cost for treatment or pumping. Thus, the 25 per cent additional revenue would greatly accrue to the benefit of the plant.

Advertising the local water works with either serious or humorous copy shows the reader of the newspaper that the water works is "alive," and that it is directed by men who are interested in the community and what they are doing for it. Some representative of an industry, looking over the local paper and sizing up the community, sees the water-works advertising and realizes that here is a utility which will be of genuine help to it if it locates in that town.

Another direct benefit in increasing the use of water, which applies particularly in the more arid sections, is to encourage better lawns and gardens, perhaps through offering prizes which are talked about in the advertising and displayed in the local water-works office. Every one takes a pride in the community and in the surroundings of his own home. The opportunity to win a prize because his lawn and garden are a little better-looking than somebody else's, appeals distinctly to Mr. A. C. and, at the same time, piles up a vast amount of good-will on the credit side of the ledger for the water utility.

An Unusual Community Park in a Small Town

ASHLAND, ORE., with 5,000 population, has in Lithia Park one of the most beautiful community recreation areas in the United States. This 80-acre park begins at the city plaza and becomes a natural forest, with a picturesque mountain stream running its full length.

Lithia Park, as a city institution, was dedicated July 4, 1916. The present estimated value of the acreage is about $100,000. The city's expenditure for the park is approximately $12,000 annually, including maintenance.

The administration is in the hands of the Park Commission of five members, who are elected by general vote. Maintenance funds are raised by a tax levy not to exceed two mills.

Lithia Park is an ideal summer playground and is the center of many activities. The early event of the Spring season is the annual Easter egg hunt, sponsored by the Ashland American Legion Post. In May of each year, commencement exercises for eighth grade graduates of the county schools, are held in the park, with between 250 and 300 graduates from the rural schools, and visitors and other competitors in the county Music Memory Contest, numbering more than 1,000.

The park is equipped with a modern playground, operated during the summer under the supervision of a trained director employed by the city. Tennis courts, croquet ground, archery court, horseshoe courts, an outdoor dance pavilion, beautiful drives, footpaths—are recreation features.

Band concerts are held weekly during the summer. Well-equipped picnic grounds provide ideal service for group affairs, both large and small. Numerous county and district picnics and conventions are held in the park. A beautiful modernly equipped auto camp is a park adjunct, known all over the West.

The history of the park dates from 1893, when one southern Oregon Chautauqua Association purchased a small tract of land, and erected the Chautauqua buildings. The natural grove was developed into a small park and camping center for the hundreds from northern California and southern Oregon who annually came to Ashland to attend Chautauqua. The Association later transferred the property to the city. Additional land extending up the canyon was purchased, and John McLaren, landscape architect, who laid out the famous Golden Gate Park in San Francisco, designed the natural forest area.

The natural beauty was enhanced by the addition of many rare and beautiful shrubs, trees and flowers. The sparkling stream, Lithia water fountains, fresh water fountains, ornamental fountains, sulphur water grotto, are features of the park. Ashland Creek is fed from the snows of Mt. Ashland, a 7,600-foot, snow-capped peak overlooking the city. Water is diverted to form artificial lakes and waterfalls. The Lithia and sulphur waters come from the famous mineral springs in foothill territory.

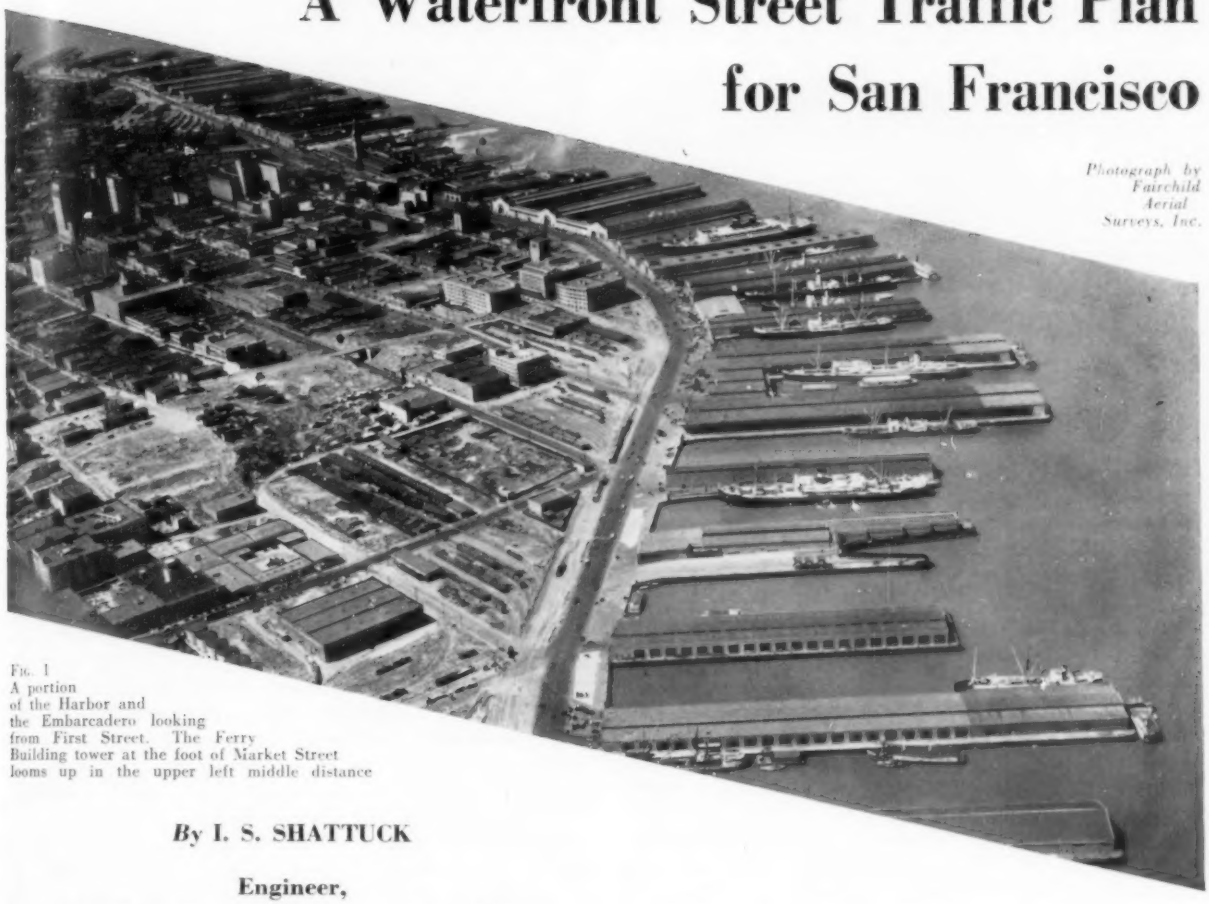
Introducing Children to Cows

TOWNS in the West and Middle West, particularly in the sparsely developed states where native wild animals still exist, have recently begun to assemble collections of such animals and to exhibit them for the education of the child citizens. Big cities, one by one, are recognizing the necessity of familiarizing their school child population with the commonest of barnyard animals. New York, Cincinnati, Boston, and Los Angeles all have definite plans to this end.

Mayor James M. Curley, of Boston, some time ago had a cow put permanently on exhibit in the Franklin Park Zoo. Recently he discovered that the cow had disappeared, and forthwith ordered another. Commenting editorially on the occurrence, the *Christian Science Monitor* suggests that Edmund Lear, had he lived to learn of Mayor Curley's thoughtfulness, would doubtless have rewritten one of his most famous limericks as follows:

There was a good Mayor who said, "Who
Has removed my poor cow from the Zoo?
I'll send out another,
Her sister or mother,
That the children may hear her say 'Moo.'"

A Waterfront Street Traffic Plan for San Francisco



Photograph by Fairchild Aerial Surveys, Inc.

FIG. 1
A portion of the Harbor and the Embarcadero looking from First Street. The Ferry Building tower at the foot of Market Street looms up in the upper left middle distance

By **I. S. SHATTUCK**

Engineer,

San Francisco Traffic Survey Committee

THE Embarcadero, 2.88 miles in length and 200 feet in width, is one of the great waterfront streets of the world. With Market Street, it ranks as one of the two most important traffic ways in San Francisco. The utilization of the width varies materially at different locations. Three general services are accommodated: sidewalks for pedestrians; a vehicle roadway; and the right-of-way of the belt line railroad, with its spur tracks onto piers.

The general location of the belt line trackage is along the land side of the street, the width of trackage varying from one to four tracks. From the land side, the Embarcadero is entered by 48 streets, most of them coming in at oblique angles, forming complicated intersections. On the waterfront side, access is afforded to 40 piers, by means of truckways leading into transit sheds and by 59 spur tracks of the belt line railroad.

Terminal facilities for the transbay ferries are located at the foot of Market Street in the approximate center of the waterfront, where the Ferry Building houses ticket offices and waiting-rooms, with access to the boats in the slips. The Harbor Commissioners* have shown energy and foresight in providing special traffic facilities in the immediate vicinity of the Ferry Building.

This is an area of great traffic concentration and complexity. Market Street with its four trolley tracks is the main transportation channel between the Ferry Building and the business district. The four Market Street car lines loop on the Embarcadero in front of the Ferry Building to serve ferry passengers. Car movements to and from the loop number 5,690 during a 12-hour day, with a 30-second headway on each track during the rush hour.

The problem had been partially dealt with, prior to the study described in this article, by the construction of a vehicular subway in the Embarcadero, two traffic lanes in width and 1,000 feet in length, which passes the Embarcadero traffic under the surface loop. A further relief has been provided by a pedestrian viaduct extending from the foot of Market Street over the Embarcadero to a connection with the upper level of the Ferry Building, from which direct access is had to the upper decks of ferries.

The Present Problem

The traffic problem on the Embarcadero as revealed by basic engineering studies† is mainly one of confusion and hazard with occasional congestion. The great unchanneled width of the paved roadway (99 feet in places), with

* The San Francisco harbor, including the Embarcadero, is owned by the state of California, the operation and control of the harbor resting with the Board of State Harbor Commissioners. This Board may construct and maintain such port facilities "as may be necessary for the landing, loading and unloading, and protection of all classes of merchandise, and for the safety and convenience of passengers."

† Recently completed by the San Francisco Traffic Survey Committee under the direction of the author and Dr. Miller McClintock, of the Erskine Bureau, Harvard University.

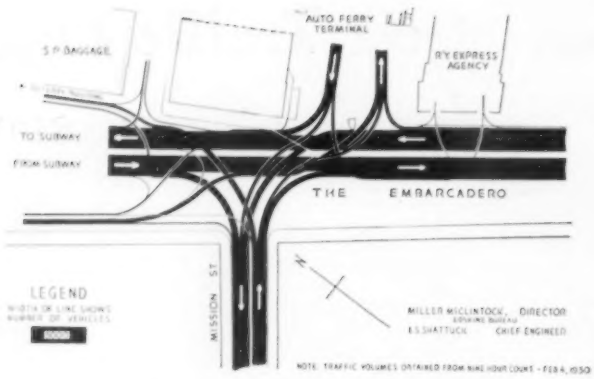


FIG. 2. TURNING MOVEMENTS

These movements as diagrammed cause considerable confusion of traffic in the Embarcadero roadway, which is 200 feet wide here

no definite traffic regulations, encourages careless driving practices. Slow-moving trucks usurp the middle of the pavement, forcing passing vehicles to swing over to the wrong side of the roadway. The traffic check revealed many instances where vehicles were as far as 25 feet on the wrong side of the center line.

Parking adjacent to pier entrances is uncontrolled. Upon the arrival or departure of large ships, the roadway in front of the piers is almost completely taken up with parked vehicles and standing trucks and taxicabs. Often there is room for only one line of moving vehicles to pass. Vehicles cut corners and proceed across the Embarcadero at oblique and hazardous angles when entering or emerging from connecting streets.

In front of the Ferry Building, where the subway provides vehicular connection between the north and south halves of the waterfront, the confusion and hazard are greatest. Traffic flows through the subway very slowly because of the difficulty of dispatching vehicles at the ends, where the multiplicity of turns in and out of the subway causes frequent blockades. (See Fig. 2.)

Physical deficiencies of certain connecting streets, due to poor pavement, severe grades, or the existence of railway trackage, result in a concentration of travel to and from the waterfront on relatively few streets. There is therefore a misrouting of truck traffic which adds to the cost of moving freight and commodities.

The Embarcadero Traffic Plan

The plan is in two parts: first, recommendations for the improvement and redesign of the Embarcadero roadway; and, second, recommendation for the improvement of routes connecting the waterfront with the business and industrial districts.

1. *Redesign of the Embarcadero Roadway*

A system of traffic channelization is proposed for the Embarcadero by the establishment in the center of the roadway of a medial strip. This strip is 4 feet wide, except near the Ferry Building, where it spreads out into a series of wide islands at each end of the subway.

Figure 3 shows the proposed roadway design in a section where the 4-foot medial strip is established in the center of the roadway. The medial strip has openings opposite all connecting streets and pier entrances. On each side of an opening is a traffic island composed of a series of fluted traffic buttons. In the center of the opening is a reference point to turn around. Between the button islands the medial strip is defined by wide painted lines on each side.

Each traffic lane is 11 feet wide, the lane next to the medial strip being for fast-moving vehicles, and that furthest from the medial strip for slow-moving vehicles. Adjacent to the curbs in front of piers, dual storage lanes

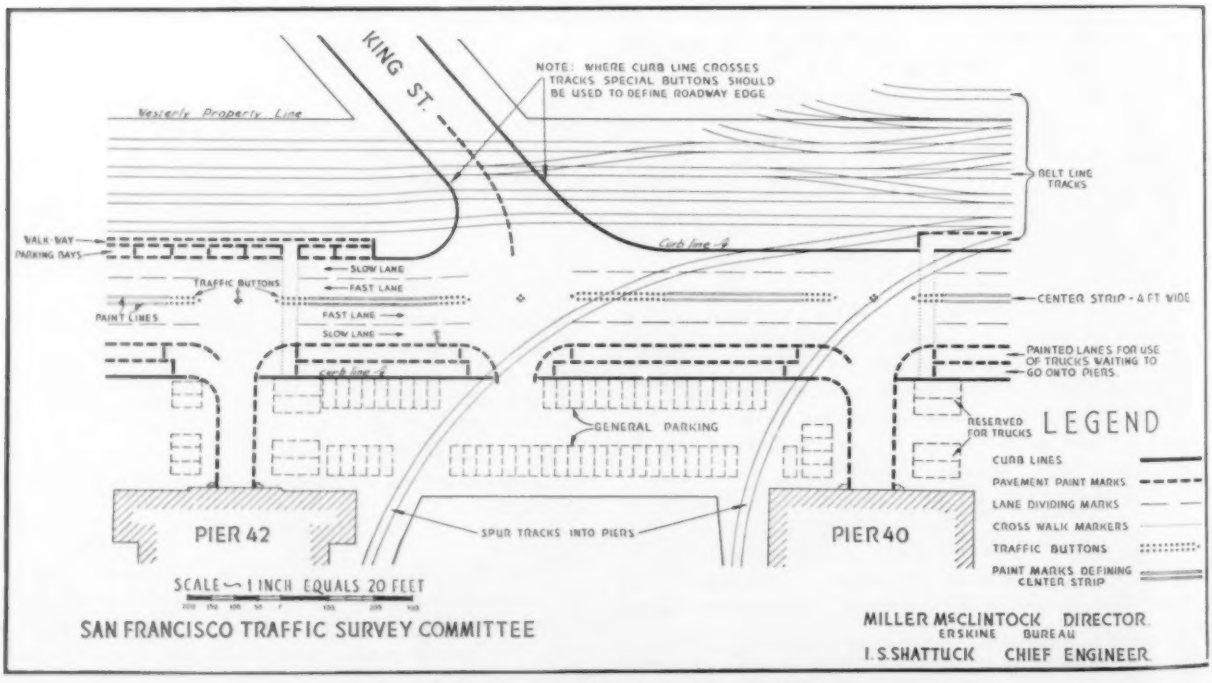


FIG. 3. PROPOSED DESIGN FOR THE EMBARCADERO

This will channelize traffic and provide capacity for more than double the present traffic volume

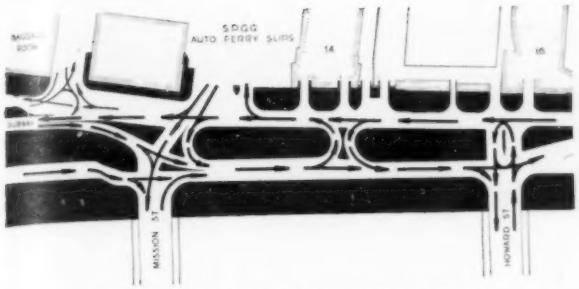


FIG. 4. A DIAGRAMMATIC EXPLANATION
of the plan proposed for the point of greatest traffic difficulty. Confusion and congestion will be reduced by the traffic channels provided for turning movements

are marked on the pavement, for the use of standing trucks waiting to deliver or receive freight on piers, and for taxicabs waiting to pick up passengers coming off boats. General parking is prohibited in these storage lanes, but is allowed on the opposite side of the pavement, where marked bays are established. A walk in back of these general parking bays is for the use of persons walking to the nearest crosswalk.

The two traffic lanes in each direction have a traffic capacity more than double the maximum traffic observed on the Embarcadero. The present roadway, although wide, cannot be utilized to its fullest extent because of the lack of driving and parking regulations. The proposed plan will furnish the traffic police with something definite to enforce, and traffic will move more expeditiously and safely.

Figure 4 is a diagram of traffic movement which will be established at the south end of the subway, where the wide islands are located in the center of the roadway. The white areas are roadways and traffic channels. A one-way rotary movement of traffic is established here, which will entirely eliminate the difficulty of the turns at the end of the subway, and will provide for the crossing of traffic streams at right angles. Compare the regular movement thus established with Figure 2, which shows the complicated turning movements now existing in this same area. The islands are entirely surrounded by curbs with parking bays in the center. An entrance and exit to parking spaces is provided at each side of each island.

The treatment of the area just north of the subway is similar to that of the south end—namely, the establishment of one-way rotary traffic flow on each side of a series of islands.

The necessary traffic warning beacons, keep-to-the-right signs, one-way signs, parking signs, etc., are recommended to be erected in conformity with the standards of the National Conference on Street and Highway Safety.

2. *Improvement of Routes Connecting with the Waterfront*

A study of the origin and destination of track movements revealed the need for the improvement of direct arteries between the waterfront and the commercial and industrial districts of the city. A major street plan for the entire city formerly prepared for the Survey Committee by Bartholomew and Associates recommended (1) major industrial thoroughfares for the circulation of traffic in the vicinity of the waterfront, (2) major routes to bypass the waterfront, and (3) an extension of the Embarcadero southerly (along a portion of the harbor little developed) to connect with the proposed quays of a future industrial harbor.

The routes on the major street plan proved to be those which the origin and destination study showed to be lacking. This is a splendid tribute to the intelligence and skill of the street-planning work.

A program for the progressive improvement of definite trucking routes is recommended, including, first, paving; next, curb setbacks; and, eventually, street widening. The reduction of severe grades is also recommended on two routes.

Conclusion

The establishment on the Embarcadero of a plan of channelization of traffic, and the provision for definite parking and truck-storing areas will result in a more orderly and expeditious movement of freight by trucks. By remedying present traffic difficulties before they become too serious, San Francisco can avoid waterfront traffic congestion such as is found in New York and other ports.

The Embarcadero Traffic Plan was completed in January, 1931, and submitted to and approved by the Special Committee of Waterfront interests, after which it was submitted to the Board of State Harbor Commissioners. The adoption of the plan for the redesign of the Embarcadero roadway rests with the Board. The improvement of traffic routes connecting with the waterfront must, however, be taken up with the proper city authorities. The San Francisco Junior Chamber of Commerce has endorsed the plan and agreed to assist the Survey Committee's staff and the private waterfront interests in efforts to secure the carrying-out of the plan by the Harbor Board and the city.

The most important industry in San Francisco is the harbor, with its related activities. It is necessary to provide for the free circulation of vehicular traffic to and from the waterfront in the future, so that freight may be moved expeditiously. The private shipping and waterfront interests now feel that they have a comprehensive plan for the development of traffic facilities, and that their efforts can be combined toward the progressive realization of this plan.

FIG. 5. THE RECOMMENDATIONS OF THE TRAFFIC SURVEY COMMITTEE ARE BEING APPLIED TO THE EMBARCADERO AS SHOWN ABOVE
The traffic buttons had not been placed when this photograph was taken

THE FLEET OF MACK COLLECTION TRUCKS

The Refuse Disposal Problem and Its Solution in Providence, R. I.

By **IRVING M. STONE**
Superintendent, Incinerator Department

THE disposal of the solid municipal wastes—ashes, rubbish and garbage—presents a problem the solution of which demands the immediate attention of all city officials. Sanitation, economy, convenience and sightliness are the angles from which this problem must be studied. As the seasons change, the wastes are produced in varying quantities, each season presenting a problem as to the most efficient and sanitary means of collection and disposal.

Governmental surveys have disclosed that nearly every municipality conducts collection systems. Some cities collect garbage only, others collect garbage and refuse, and the rest conduct collection systems that dispose of all wastes, including ashes. Most of the cities operate their own disposal systems, and others let this work out to private contractors.

We find, however, that each city considers waste collection as a necessity, especially the disposition of garbage. The collection of ashes and rubbish is possibly incidental. Garbage is the outstanding problem in waste disposal, as it is always a potential menace to health. Rubbish and ashes are, in the smaller cities, effectively disposed of by the individual, but we are rapidly approaching the time when the disposal of these will also be problems demanding immediate attention.

At this time the problem of garbage collection and disposal is apparently the duty of every municipality, with the matter of ashes and rubbish of questionable necessity.

Methods of Disposal

The methods generally recognized as possible for finally disposing of garbage are dumping, hog feeding, incineration, reduction and burial.

Dumping and burial are inferior means of disposing of wastes, as the materials create a menace to those living in the vicinity of the fills. They serve as breeding-places for all species of vermin, and oxidation is so restricted that complete decomposition does not take place. In fills opened after a lapse of many years, the materials were found to be but partially consumed. Internal fires are also a possibility where rubbish is dumped with garbage, and these dumps always present an unsightly spectacle, particularly where coarse rubbish is allowed to appear over the surface.

The idea that former fills can be used as building sites should be discouraged, as it must be realized that the fill has no stability as a foundation, and its contents will always be a source of annoyance if not an actual breeder of disease. Regardless of the precaution taken, offensive odors will be generated.

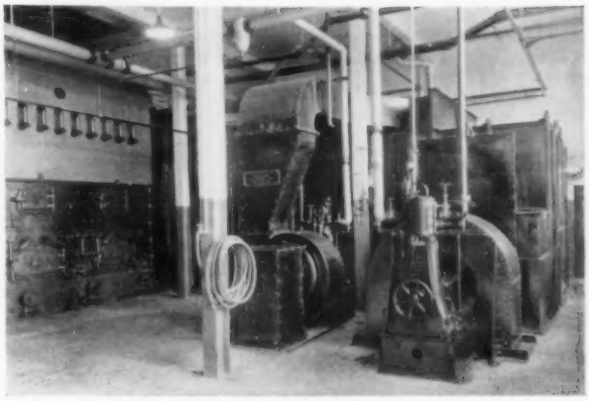
Hog feeding is fairly effective, but the economic value is greatly affected by the market value of pork on the hoof. Where the hogs do not consume all of the garbage, the remainder presents the same problem as in dumping and burial. Most cities will not allow pig farms within their borders, and outlying towns oppose the hauling of garbage and refuse along their thoroughfares. If a town does allow the establishment of a hog farm, the town has the privilege of obtaining an injunction against its operation at any time. There is also a possibility of the mar-

ket's affecting the finances of the hog owner, which would cause the suspension of collection and disposal.

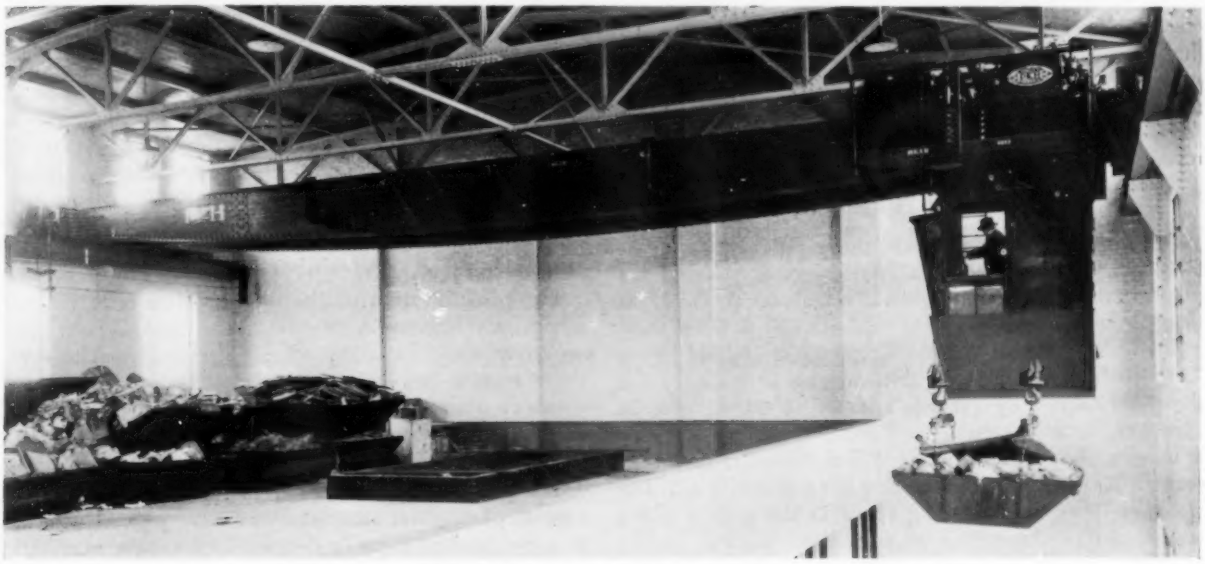
Reduction is a method by which soap grease and tankage are reclaimed. Grease is the important by-product although the tankage must pay part of the revenue. When the market for grease or fertilizer is favorable, this method of disposal is worthy of consideration. During the war the grease market was invaded by substitutes for garbage grease, and these conditions have remained, causing a small demand for the by-product obtained during the process of reduction. The fertilizer market is inactive, with little promise for the future. Reduction plants while in operation create nuisances due to the obnoxious odors emitted during the processes. Therefore, the economic value of reduction plants is questionable at the best, and the experiences of municipalities have been such that properly kept books have not shown a favorable balance.

Incineration is a positive method of disposal and the cost is not excessive. It has not proved objectionable to the communities in which it is located and it destroys all kinds of garbage and refuse, leaving a residue of ashes.

All the foregoing methods of disposal were thoroughly investigated by officials of the city of Providence before they finally decided on the adoption of the incineration method. Since the City of Providence Incinerator Department started operation, in November, 1927, rubbish has been collected with the garbage. This new service, according to health officials, has greatly improved the sanitary conditions of the city; and officials of the Fire Department say that rubbish fires have been reduced 75 per cent since its inauguration.



BLOWERS FOR THE DECARIE INCINERATOR AT PROVIDENCE



CRANE LIFTING A CONTAINER FROM A TRUCK FOR DELIVERY TO LOADING FLOOR

DUMPING A CONTAINER INTO THE INCINERATOR

Improved Collection Methods

With the new system came an improved method of disposal by the housewife. Formerly she deposited loose garbage in the container and it remained there until collected by the city. In this condition the garbage fermented, causing disagreeable odors, and it also attracted flies and other vermin. Now the housewife drains, wraps and ties the garbage and deposits it in a clean, dry container. This method is clean and odorless, does not attract flies or vermin and facilitates collection. The paper used as a wrapper gives a greater percentage of mixed refuse, which aids combustion during the process of incineration.

The land on which the incinerator stands is approxi-

mately ½-mile from the City Hall and covers about 51,842 square feet. The inside dimensions of the building are 61 x 99 feet. It is two stories high, and flanking it on one side is a twenty-car garage, including a repair shop; on the other side is a scale house and scale. All are of fireproof construction.

Operation of Incinerator

Two electric cranes, of 2½ tons capacity each, are used to hoist all garbage and refuse received at the incinerator to the second or hopper floor. Here it is charged into furnaces or incinerators from the top, and after entering the boilers rests on a basket grate, where it is held until dried, and then it is stoked to the lower or fire grate, where the actual burning takes place. The ashes are deposited in pits directly below the fire grate, where they remain until cool, and are then conveyed by industrial railway and elevator to an elevated storage bin and then by gravity to trucks for carting to the city dump.

During the process of burning, forced draft is afforded by means of steam-driven blowers and induction fans and a 175-foot chimney, built on its own foundation just outside the building. The gases generated from the burning refuse in each unit pass through their individual combustion chambers, and thence through brick-lined flues to the chimney. The chimney is outfitted with a steam jet which sends live steam into the stack, thus retaining soot and other elements that would otherwise be emitted from the stack. Each unit has a rated capacity of 80 tons mixed refuse per 24 hours.

Overload Operation

At the present time, however, the plant is operating at a 40 per cent overload, which necessitates running the plant on three shifts on a 24-hour schedule. The increase in commercial refuse, that is refuse received from business houses, has been enormous, and the household refuse has also increased greatly, thus making it necessary for the plant to destroy garbage and refuse 40 per cent in excess of its rated capacity.

Commercial refuse is accepted if delivered at the incinerator. To render the best service to commercial vehicles, we have made an unloading space in the garage where steel containers, mounted on four-wheel trailers, are in readiness to receive commercial refuse at all times. The loaded trailers are hauled to the cranes by automotive power.

Operating Personnel

The personnel of the plant includes a chief engineer, three assistant engineers, four cranemen, one truck driver, fifteen firemen, nine hoppermen, six floormen and one watchman on half-time. The plant operates on three shifts, one from 6:00 A.M. to 12:00 M.; the second from 12:00 to 9:00 P.M.; and the third from 9:00 P.M. to 6:00 A.M. The first shift, as shown by the schedule, works but six hours a day, making a total of 36 hours for the week. On Sundays, when the plant is not in operation, this same shift works nine hours making minor repairs and cleaning the flues, combustion chambers, bottom of the stack, etc. This work is done with the aid of a compressed air outfit.

Collection Equipment

The collection equipment consists of sixteen 2½-ton trucks and six horse-drawn vehicles each carrying two demountable tanks, each tank having a capacity of 2 cubic yards level full; two coupes for inspectors, one sedan used by the superintendent; one 2-ton dump-truck is used in response to complaints, should a household be overlooked by the regular collectors. A 5-ton dump-truck is used by the plant to cart ashes. Each of the collection vehicles is manned by a driver and two helpers and is required to cover a certain portion of a set route each day. The routes are covered twice a week during the winter and three times a week during the summer. The routing is based on the amount of refuse received per truck per mile, and at all times each route supports a uniform tonnage per mile.

The personnel of the collection system consists of two inspectors, twenty-two drivers, forty-four helpers, two mechanics, one garageman and one watchman on half time.

Administration

The administration of the whole system is carried on by the superintendent, one clerk and one checker. The superintendent has charge of all operations. The clerk records costs and keeps records of operation, and the checker's duties consist of the tabulating of the amounts of garbage refuse received, the residue disposed of, routes and complaints.

The public of Providence have found the incineration method of disposal satisfactory and are pleased with the results obtained by it. In fact, at the present time officials of the city of Providence are contemplating the addition of a unit to the present plant or a new plant to handle the present overload.

Tear-Gas Tests in Boston

THE police department of Boston, Mass., recently conducted tests of tear-gas bombs, in a vacant building on North Street. Three members of the inspector's department, William Cohen, Patrick J. O'Reilly and Richard Hennessey, were detailed to go into the building and see whether the new invention, a gun that releases the gas, was effective. Inspector William Sullivan, with gas mask on, was also assigned to the interior of the building.

Capt. Louis Lutz, the department drillmaster, then discharged the gun, which fires a cartridge 8 inches long and 1½ inches wide. It was fired through a window in the section of the building where the four inspectors were, and the cartridge was timed to open four seconds after discharge from the gun.

The men remained slightly more than a minute after the gun was fired. Inspector Sullivan, wearing the mask, was not affected by the gas. Tests were also made of gas bombs and of a police billy containing a small cartridge of tear gas.

The demonstrations were witnessed by Police Commissioner Eugene C. Hultman, Police Superintendent Michael H. Crowley, Lieut. Thomas S. Kavannaugh, Inspector James Claflin, Charles Gowell, policy property clerk, and a large detail of patrolmen. The tear-gas apparatus was from the Lake Erie Chemical Co., Cleveland, Ohio, and Federal Laboratories, Pittsburgh, Pa.

PORTION OF A 10,000-YARD RESURFACING JOB
This was completed in 1930 with extra binder and a 1½-inch sheet asphalt top

Methods Used in Resurfacing Old Pavements

By ARTHUR H. WEDGE
City Engineer, Wooster, Ohio

THE use of sheet asphalt for resurfacing worn block pavements was begun in Wooster, Ohio, in 1924. In that year the City Council approved the Engineering Department's plans for resurfacing two streets, in the face of considerable opposition. The opponents held that the method could not possibly be a success.

Investigation of the existing pavement, which was laid on a broken stone and gravel base, had indicated that it would be substantial and stable as a base if the surface to be applied was effectually sealed so as to prevent the transmission of water through this base. The Department further held that the addition of a smooth, resilient wearing surface would reduce the traffic impact load and lessen the wear and tear on the base.

The specifications called for an inch of binder and an inch and a half of top with extra binder allowed. Quite a number of tons of the latter was used in reducing an excessive crown and reshaping the intersections.

Resurfacing Stands up Under Traffic

The bitumen content of the resurfacing material throughout varied from 10.3 to 10.9 per cent, and the dust varied from 11.5 to 16.1 per cent, producing a somewhat softer pavement than would be the accepted practice on a heavy-traffic street today. Nevertheless, the pavement has evidenced no tendency whatsoever to shove, roll or wave under the great amount of traffic it has been called upon to carry. A longer period of time may show up such weaknesses, but this is not considered likely when for six years the pavement has remained firmly in place. U. S. Highway No. 30, the Lincoln Highway, traverses the full length of the street; State Routes 3, 76, 36 and U. S. 250 also contribute traffic that uses all or part of these streets. Owing to angle parking, this traffic is concentrated on a two-lane strip in the center of the street.

Maintenance costs have been slight. Excluding service cuts and other public utility cuts, all of which are not strictly chargeable to maintenance of a pavement, the cost for maintenance over the period of 1924-1929 inclusive, for which complete figures are available, has been $0.00155 per square yard per year.

North Market Street and East Bowman Street were resurfaced in 1929, and South Market Street in 1930. Some improvements over previous practice were made. All water services were renewed with copper tubing. The refill was carefully tamped back, but instead of replacing the old wearing surface, a 6-inch reinforced concrete base, "benched" firmly on undisturbed earth, was substituted. A great deal more attention was given the old stone curbing. By redressing or resetting, or both, it was brought as nearly true to line and grade as possible, thus adding materially to the appearance of the street. Intersections were expanded by the installation of a longer-radius circle curb.

Improved Methods

One feature of the work on Bowman Street was different from the usual resurfacing job. Two blocks of the street had had a strip resurfaced through the center. The edges had been feathered off and sealed, leaving two strips of the old pavement showing at the curbs. This resurface was rather too thin to have the edges cut off and new material joined on at the sides to complete the job. The cross-sections showed that the old strip had been laid true to crown. It was therefore decided to sweep the old asphalt scrupulously clean, fill in along the sides with binder, "spider web" the old sheet surface generously with asphalt cement, and lay new top over the whole, using the old strip in place of binder. The heat of the new material was kept almost up to the limit allowed by the specifications in order to get the effect of softening the surface of the old top and promote a bond between the two layers of top. Results so far indicate that this was successfully done.

On resurfacing work the specifications now call for a

smaller maximum size of binder stone than is usual for new work; ¾-inch is the largest size allowed. It has been found that this saves binder and produces a better surface on which to lay the top. Where the old surface is irregular it enables the binder to cover the high spots without making it necessary to spread a greater thickness than is absolutely necessary or than is desired, and then raise the rest of the section accordingly with an extra thickness of binder to make a true crowned surface.

Asphalt Specified to Meet Traffic Conditions

On South Market Street traffic at every intersection is handled by lights. Just to the right of the center of the street and extending about 50 feet back from the "Stop" at each of these intersections, the asphalt top mixture was made harder than the remainder of the surface to prevent, if possible, any shoving or waving of the surface due to cars making a sudden stop with a change from green to red on the lights. These strips were carefully marked and their condition will be observed as time passes, to determine the success of the experiment.

The asphalt top mixture on North and South Market and Bowman Streets showed an asphalt content varying from 9.5 to 10.3 per cent, and the dust ranged from 13.7 to 17.3 per cent.

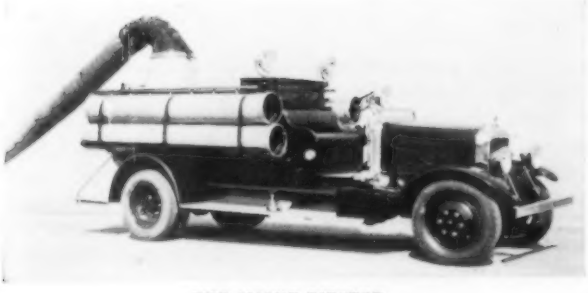
COSTS

Street	From	To	Year	Const. Cost	No. Sq. Yds.	Cost per Sq. Yd.
E. Bowman	Market	Spink	1929	$15,341.15	10,216	$1.50
N. Market	Liberty	Bowman	1929	17,578.00	10,774	$1.63
S. Market	Spruce	Liberty	1930	17,659.31	11,862	$1.49
E. & W. Liberty	Pittsburgh	Todd Cor.	1924	50,129.50	25,666	$1.95
Average cost per square yard						$1.72

These costs per square yard include all curb and drainage work, new base and, in fact, all items except engineering, inspection and incidentals.

The engineering on these projects was in charge of C. L. Orr, City Engineer, 1923-1926, with the writer as Assistant Engineer, and from 1926 to date the writer has been City Engineer, with J. E. Fox as Assistant Engineer. The General Asphalt Paving Co., of Canton, Ohio, performed the work, using Texaco asphalt. The H. C. Nutting Co., of Cincinnati, Ohio, furnished street and plant inspection.

Sucking Smoke from Tunnel Saves Lives



THE SMOKE EJECTOR

IN the Chicago sewer tunnel disaster of April 13, where eleven men lost their lives by suffocation or asphyxiation, still greater casualities were prevented by the use of a "smoke ejector" hurriedly summoned from the Kenosha factory where it was being completed. The burning of the timbering that was in place for the construction of the tunnel filled the latter with smoke and fumes. The non-appearance of some of the workmen caused a rescue squad to enter the tunnel, but the party was trapped by smoke and gas accumulating between them and the exit shaft, and sought shelter behind a bulkhead in the east heading, where there was no smoke or fire. Sixteen men were confined here for over twelve hours, but they were finally enabled to escape because of the use of the smoke ejector. This device, which was originated by Fire Chief W. Ringer, of Minneapolis, Minn., has been in process of development and manufacture by Peter Pirsch & Sons Co., of Kenosha, Wis., where it has been experimented with for several months.

The machine that was sent to Chicago was only partly completed when the call came in at 2:00 A.M. to send help. Several men were called to the plant and worked desperately wiring the Continental motor, installing carburetor, distributor, wheels and tires, etc., and at 5:45 it was ready to go. Despite the fact that the motor had never been turned over before, the 52-mile trip to Chicago was made in only 88 minutes.

Fourteen minutes after the machine started to draw smoke, gas, etc., from the shaft, the men who were trapped at the far end of the tunnel began to come out through the elevator shaft after having been shut in by the presence within the tunnel of smoke, gas, and fire so hot that it melted the rubber clothing and burned the air hose of a diver sent down to rescue them. The machine was kept in service at the fire for six hours without a stop.

Requiring Advance Payment of Water Rents

THE extent to which a water company, or a municipal water department, may require a consumer to pay in advance for service, has been the subject of discussion by the courts in interesting cases.

A standard legal authority thus summarizes decisions of the appellate courts of the seven following states: Alabama, Idaho, Maine, Pennsylvania, New York, Tennessee and Washington.

"The company may lawfully require consumers to pay water rents for a reasonable length of time in advance, and may make the payments fall due quarterly or at other intervals, and make an extra charge in the nature of a penalty for delinquency, but a regulation requiring takers of water to pay rent for the whole year whether they actually use it for that length of time or not, without special agreement, is unreasonable and not binding."—40 Cyc. 804.

In the case of *Sims v. Alabama Water Co.*, 87 So. 688, the Alabama Supreme Court said:

"The general rule is that private or municipal corporations furnishing the public with water may adopt and enforce a rule that water will be shut off for non-payment, and may prescribe a reasonable minimum advance payment which also may be enforced likewise."

A. L. H. STREET.

Reading, Pa., and Laurel, Miss., Win in Recreation Contest

By L. H. WEIR

National Recreation Association; Editor of Parks: A Manual of Municipal and County Parks

I HAVE studied very carefully the statements of the Superintendents of Recreation concerning the "Best Playground Idea Carried Out in 1930."*

Among the cities of 50,000 and above, I select Reading, Pa., as presenting the most outstanding and far-reaching "idea" in that it represents general advancement in planning, increasing facilities, broadening the scope of recreation services and securing very effective cooperation among public and private agencies. This is the kind of idea more superintendents of recreation might well keep constantly in mind.

Few, if any, of our cities are as yet adequately planned or equipped with the necessary play and recreation facilities, or have broadened their programs sufficiently or developed the team work among the several public and private agencies necessary to grapple adequately with the ever-increasing demands of the new leisure arising out of a machine age.

All the ideas from cities of this group are good. The method of inculcating safety habits inaugurated by Mr. Pritchard, of Niagara Falls, is unique. The safety idea worked out in Indianapolis, involving wide public and private cooperative relationships, evidently brought very effective and desirable results.

The playground mother's club idea of R. L. Bass, Jr., Superintendent of Recreation, San Antonio, is a most important and fundamental one. It should be adopted as a basic principle in playground and recreation organization everywhere. To have an effective method of handicapping in conducting horseshoe contests as practiced in Tacoma, Wash., during the season of 1930 is very useful for all play and recreation grounds.

It has always been a disappointment to me that we do not have in every city some playgrounds designed and constructed after the fashion of the idea advanced by George Hjelte, of the Westchester County Recreation Commission. Practically all playgrounds in their design show lack of imagination and lack of understanding of the inner workings of a child's mind and spirit. We do all sorts of things for his legs, arms and body in playground equipment but little that appeals to his equally lively and even more important imaginative self.

The idea of reviving types of apparatus like the teeter ladder, using wood in its construction instead of the heavier iron ladders, and of reviving such games as tether ball is suggestive of the possibility of making a dangerous piece of apparatus safe; also that a good game should not be wholly dropped because at one time players lost interest in it.

To take a special interest in the baby is a sure method of gaining the interest of the mother. The Healthy Baby Contest as carried out among the mothers' clubs on the playgrounds of Pontiac, Mich., also brought the City Health Department into active cooperation with the Recreation Department.

Cities Under 50,000

I award the prize to Laurel, Miss., for its idea of combining beauty with facilities for active recreation in all its park and recreation areas. In this little city of about 18,000 inhabitants there are twelve different areas, some serving specific sections of the city, and other serving the city as a whole. The people of Laurel preserve all the natural beauty of topography and plant life in its several areas, enhance this beauty wherever possible by the skill of the landscape artist, and at the same time provide facilities for those forms of active recreation through which children, young people and adults find a larger abundance of life. *This is an idea which should be an idea of every park and recreation department throughout the country.* Certainly, every playground or other active recreation area should have some of the characteristics of a park, and most park areas should have some form or forms of active recreation facilities. The love of beauty is one of the natural and fundamental hungers of the human soul.

Too much praise cannot be given to Wausau, Wis., for successfully constructing and operating a wading and swimming center which would be a credit to a city many times its size. This center represents not only a fine artistic achievement but a recreation facility of surpassing excellence. No park and recreation system is complete without one or more wading and swimming centers, the number depending on the numbers of people to be served.

The idea of Boulder, Colo., of providing better opportunities for outdoor life for all through the construction of riding and hiking trails, through more winter sports facilities such as skiing, tobogganing, coasting and skating, etc., is of the utmost importance to the welfare of the people of towns and cities where habits of living and working tend to be too passive and too much indoors. If biologic decadence of urban people is to be prevented, there must be more and better opportunities for the people to spend a great deal of their leisure time in the open in activities which use the large fundamental muscle groups of the entire body. Boulder is especially well equipped with areas for this purpose. It has less than 12,000 inhabitants, yet has over 8,000 acres of park properties.

Yakima, Wash., has excellent swimming facilities, and the idea successfully carried out there in 1930 was to use these facilities not only for recreational purposes, but also as instructional centers. The "Learn to Swim" campaign conducted by the Recreation Department for grade-school children involved in active participation over 50 per cent of the 3,000 children of this age-group. A great many towns and cities throughout the country have swimming facilities, but not nearly all of these communities utilize their facilities for definite instruction. It should be the aim of school authorities and of recreation superintendents everywhere to see to it that every child physically able is taught to swim.

The idea of Fond du Lac, Wis., which was expressed in the construction and operation of a small golf course primarily for children, is one which I think will be adopted in many cities and towns. Large municipal golf courses are being added very rapidly to the recreational equipment of cities throughout the entire country, but there is a distant place for the small or short golf course, constructed somewhat after the manner of the large public courses. It is especially significant that in Fond du Lac the course was constructed under the auspices of the Board of Education and on school property. In the training of children for the use of leisure it is fitting and proper that golf be included in the courses of instruction in games. Few, if any, games have so wide an appeal as golf.

Fortunate are those sections of the country where King Winter reigns for a few months of the year, for then the recreations of the boys and girls, and the adults, too, are greatly varied and enriched by many different kinds of vivid outdoor activities in the form of winter sports. Beloit, Wis., is one of those fortunate communities where this is possible and the idea expansively carried out during 1930 was to provide skating facilities —six centers in all—for every one, and at least once during the season to hold a colorful mid-winter frolic. Special attention is called to the methods for building up the ice on the rinks, and floodlighting the rinks.

The unique idea of conducting bicycle races as a part of the playground activities of Hamden, Conn., has a great deal of merit. The idea of conducting such races is not unique; the method employed is. I call the attention of superintendents of recreation to the description as published in THE AMERICAN CITY.

The idea of using in the program of Shelton and Derby, Conn., playgrounds a form of competition on a point rating system was carried out during the season of 1930 with apparently very favorable results in citizenship and character building.

* The conditions of the competition were announced in THE AMERICAN CITY, January, 1931, page 17, and the entries have been published in the issues of January to May, inclusive. Some of the papers were abbreviated for publication, but all were judged as written.

FORWARD STEPS

Reported by
Municipal Officials, Chamber of Commerce Executives, and Others

COHASSET COMMON

What a Community Association Has Accomplished

COHASSET, MASS.—Nearly two decades ago, a community club in Cohasset was fortunate enough to secure as a speaker John Nolen of Cambridge, who talked with us on town planning. A small group of men caught the vision from Dr. Nolen and organized the Cohasset Improvement Association, Inc., the object being "for the purpose of preserving and improving the natural beauty and sightliness of the town of Cohasset and of promoting the health, happiness and welfare of its inhabitants."

Our Association retained Dr. Nolen to make a survey of Cohasset and a preliminary report on possibilities for the future. The first major achievement was to obtain the last piece of ocean front with a bathing beach, which was not privately owned to the exclusion of residents of the town. Through private subscriptions, the Sandy Beach Association, Inc., purchased Sandy Beach, erected a dignified and practical bathhouse, and made provision that the property shall remain open for all residents of Cohasset under common-sense restrictions.

Cohasset has a very beautiful New England common, in the center of which stands the First Parish Meeting House, erected in 1747. At the end of the common there was a collection of buildings that was a menace in many ways—an unsuccessful grocery store, an old dwelling, a hay and grain building, a barber shop, a market, etc. Through the Cohasset Improvement Association, approximately $25,000 was raised to acquire the buildings and to restore this end of the common to its original condition. The property was then turned over to the town under suitable restrictions. The community now appreciates the fact that the common is a great asset.

A third substantial improvement has been realized in the acquisition through the Cohasset Improvement Association of an unsightly and poor-paying livery stable opposite the railroad station. This property covered an area of nearly half an acre. The old stable buildings were torn down, proper planting was done, and this area is now a park which is pleasing to the citizens of the town and to strangers who come to Cohasset by train.

The latest civic development, completed in 1930 through the Cohasset Improvement Association, actively assisted by the ladies of the Garden Club of Cohasset, and with the hearty cooperation of the New York, New Haven and Hartford Railroad, is another open space with proper planting, which is on the south side of the station and occupies a space formerly used for an old roundhouse, turntable etc. The planting plan for this space was made under the supervision of the office of John Nolen.

Other plans are in motion which will ultimately mean further civic improvements in Cohasset.

CHARLES W. GAMMONS.

An Accident Hazard Exhibit

BALTIMORE, MD.—The Junior Safety Council of Curtis Bay School, Baltimore, Md., under guidance of Henry Hensen, faculty advisor, has developed a model of the school's community which shows all public accident hazards and all safety devices in use, as well as the types of

BEFORE AND AFTER THE LIVERY STABLES WERE REMOVED

The upper view shows how the view of St. Stephen's Church was spoiled by the obstructions; the lower shows a summertime vista into which the stable formerly intruded

houses, industries, transportation, and physical features; and has presented this to the school. It is already proving of value in class work, assisting even the smallest and the least imaginative pupil to understand the safety problem under discussion at any time.

The railroad-crossing gate, the traffic light, the pedestrian lane, the insulator, railings, guards, and fences are prominently placed on the model so that it may be readily used to demonstrate such rules as these:

Look to the left, then to the right, before crossing the street.

Walk, facing traffic, on left side of roads that have no sidewalks.

Keep clear of all electrical wires, poles, and areas.

Coast on hills that are free from traffic intersections.

Swim and dive in water that is free from piles and sand bars, and clear.

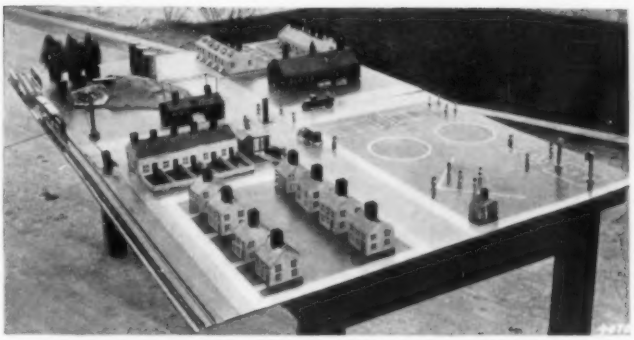
Keep inflammable materials safely stored.

Take the safest route from your home to the school.

Small wooden figures, representing boys and girls, along with toy trucks, trains and other vehicles, are used to make these situations lifelike.

A more detailed account of the work out of which this model grew, and of its travels from classroom to classroom in the school, is presented by the author in *Baltimore*, March, 1931. Through courtesy of this publication the accompanying cut is reproduced.

CHARLES F. WILLIS,
Principal, Curtis Bay School.



THE MINATURE TOWN THE BALTIMORE SCHOOL CHILDREN MADE

Fire Department Builds Large Floodlight Truck

BEAUMONT, TEXAS.—The Fire Department of this city is now equipped with one of the largest searchlight and floodlight cars in the country, which makes effective illumination at fires possible, both over the general fire-fighting area and in particular portions of it.

This piece of apparatus was constructed in our own shops, using a Reo truck with 151-inch wheelbase capable of carrying a 3-ton load. On this is mounted a power plant consisting of a 29-hp. Hercules motor driving a Westinghouse d.c. 11.5-kilowatt, 125-volt generator. This outfit developed 14.7 kw. on tests. The switchboard is installed in the cab of the truck and consists of ammeter, volt-meter, main-line circuit-breaker, double-pole, double-throw, 200-ampere switch and twelve branch circuits controlled by Westinghouse sentinel circuit breakers.

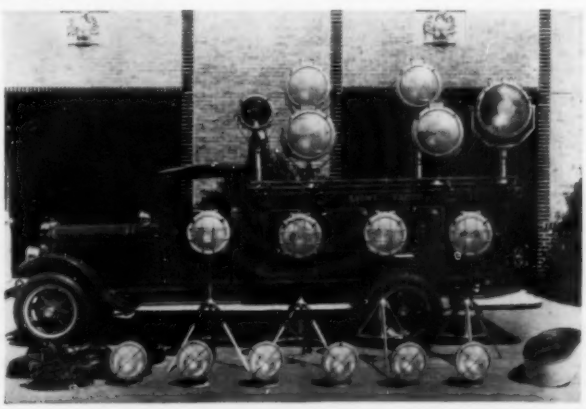
The lights, which are from the Crouse-Hinds Co., include: four LCE 1020 floodlights with 1,500-watt PS-52 lamps; one LCE 24 floodlight with 2,500-watt PS-52 lamp; one DCE 14 with 1,500-watt T-24 projection lamp mounted on elevator on top of the truck; four ADA 14 lights with 500-watt G-40 lamps, on special collapsible stands with 25 feet of Tirex cable; six ADA 12 lights with 250-watt G-30 lamps, mounted on wheelbase with 25 feet of Tirex cable.

There are two Appleton cable reels with 400 feet of No. 8 Tirex cable on each, the reels being equipped with collector rings and brushes; 800 feet of No. 10 Tirex cable with connectors and arranged in various lengths; and 1,000 feet of No. 14 Tirex cable with pin connectors and arranged in various lengths. All wiring between lighting units, generator, switchboard and cable reels and receptacles is lead-covered, rubber-insulated wire. Light units on top of the machine are connected with pin connectors so as to be easily removed if necessary. All connectors are Kliegel stage pin connectors and are of the same size so as to match at any point.

The body of the truck was designed and built in the Fire Department shop and is all metal. Doors are provided on each side and the rear to permit access to the cable reels, portable lighting equipment and power plant, and to provide ventilation. Provision is made to prevent gasoline from leaking from the carbureter to the drain on the engine-room floor. Large towing irons are provided on the front and rear of the truck for towing purposes. The total weight of the truck is 10,700 pounds.

The interior lighting of the body is served from the starting and lighting battery so as to have available lighting around the machinery in case the power plant is in trouble. Fire-protection equipment is provided in case of an emergency. Lighting units mounted on the top of the truck are arranged to be raised and lowered a distance of 5 feet and to be turned in any direction desired. The cable reels are handled with a similar arrangement. All of the portable and stationary equipment is provided with diffusing lenses and hammered reflectors to minimize glare. The 14-inch light is provided with a clear lens for distant floodlighting. The total lumen output of both portable and stationary lighting equipment is 120,568 lumens.

S. D. O'CONOR,
Fire Chief.



THE BEAUMONT FIRE DEPARTMENT FLOODLIGHT TRUCK

A Vacant Lot and Mosquito Control Ordinance

WATERTOWN, N. Y.—Our city ordinance regulating the care of vacant lots and providing for the control of mosquito breeding places, adopted last year, has proved very effective here. I can recommmend its adoption in its present form by any city desiring such an ordinance. Its provisions follow:

THE COUNCIL OF THE CITY OF WATERTOWN DOES HEREBY ORDAIN AS FOLLOWS: SECTION 1. *Insanitary or Combustible Substances or Matter on Vacant Lots Prohibited.*—It shall be unlawful for any person, either as owner, lessee, agent, tenant or otherwise, to throw, cast or deposit or to cause to permit to run, drop or remain or to be thrown, cast or deposited any decomposable organic matter which might create a nuisance or act as a breeding place for flies or as food for rats, discarded things capable of holding water which might serve as a breeding place for mosquitoes, or combustible matter which might serve to increase the fire hazard of neighboring property in or upon any vacant lot or land, enclosed or otherwise, within the city of Watertown except at such place or places designated or provided by the City Manager; provided that garbage, manure offal and other putrescible matter may be temporarily kept in suitable cans, vessels, tanks or containers which are watertight and provided with tightly fitting covers. Nothing in this section shall be construed as to prohibit the depositing of manure upon any private property for the purpose of cultivating the same.

SECTION 2. *Notice of Removal; Removal.*—If the provisions of Section 1 are not complied with, the City Manager or Chief of the Fire Department shall serve written notice upon the owner, lessee or occupant or any person having the care or control of any such lot or land to comply with the provision of this ordinance. If the person upon whom the notice is served fails, neglects

or refuses to comply with the provisions of the notice within five days after receipt thereof, or if no person can be found in the city of Watertown who either is or claims to be the owner of such lot or land or who either represents or claims to represent such owner, the City Manager, in case of anything affecting public health, and the Chief of the Fire Department, in the case of a fire hazard, shall cause such substances or matter described in Section 1 to be removed or such nuisances to be suppressed and the actual cost of such work, plus 5 per cent for inspection and other additional costs in connection therewith, shall be certified to the Board of Assessors and shall thereafter become and be a lien upon the property on which such substances, nuisances or fire hazards existed and shall be added, assessed and levied upon such lot or land and shall bear interest at the same rate as taxes and shall be collected and enforced by the same officer in the same manner as taxes.

SECTION 3. *Mosquito Breeding Places.*—It shall be unlawful to permit or allow in or upon any vacant lot or other premises any water to collect and lie stagnant in which mosquito larvae breed, or are likely to breed. Whenever the City Manager shall determine that any accumulation of water wherein mosquito larvae breed or are likely to breed constitutes a nuisance or a danger or injury to life or health, he shall proceed to suppress such nuisance or remove such danger or injury in the manner prescribed in the Public Health Law of the state of New York.

SECTION 4. *Definition.*—The word "person" used in this ordinance shall mean and include one or more persons of either sex, natural persons, corporations, partnerships, associations, joint stock companies and societies and all other entities of any kind capable of being used.

SECTION 5. *Penalty.*—Any person who violates any of the provisions of this ordinance or who shall fail, neglect or refuse to comply with the provisions of any notice herein provided or who shall resist or obstruct the City Manager or the Chief of the Fire Department or their employees in the removal of materials or substances or the abatement of nuisances or suppression of fire hazard, shall, upon conviction thereof, be subject to a penalty of not less than $25, and each day on which such a violation continues shall constitute a separate offense.

SECTION 6.—All ordinances or parts of ordinances conflicting with the provisions of this ordinance are hereby repealed.

SECTION 7.—This ordinance shall take effect upon its being published twice in the official paper.

PAUL B. DUTTON,
City Manager.

New Flashing Police Signals

BOSTON, MASS.—Thirty police call boxes in the Brighton district of Boston have been equipped with new flashing lights by means of which patrolmen can be instantly summoned from precinct headquarters, and the system will gradually be extended to other districts.

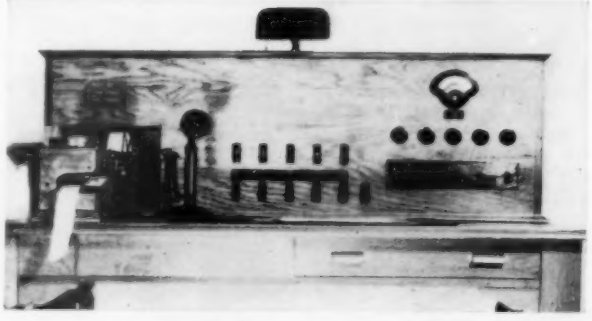
The lights were devised by Timothy A. J. Hayes, Director of Signal Service, Boston Police Department, and his assistant, Leonard M. Sjogren, and were made by the National Marine Lamp Co.

A more effective check upon the movements of patrolmen covering their routes than was provided by the duty call every 40 minutes, appeared to be desirable to Police Commissioner Eugene C. Hultman, upon his taking office a year ago, and it was in accordance with his ideas that the new system was worked out.

The new signal system is operated from the various precinct headquarters, and when the lights start flashing, the patrolmen must report at once. A citizens' alarm is also provided by means of which the public may summon an officer in an emergency. The lights flash the number of the box that is pulled and also register it on the tape at the control desk in the station house.

The lights are red with Fresnel lens, 40-watt lamps of 60-70 candlepower being used. They are visible 1,500 feet away in bright sunlight and can be seen for a long distance at night. The lights are 16 feet above the level of the street.

The central energy system is used with storage batteries at the precinct headquarters. The current for lighting is 110-volt, furnished by Westinghouse motor generators. The lamps flash for three seconds and then are dark for one second, the flashing being repeated until the call is answered. The installation of the new system involved the change from a closed circuit to an open circuit utilizing two wires in place of four used previously.



ABOVE IS ONE OF THE SIGNAL LIGHTS

AT THE LEFT IS THE SIGNAL CONTROL DESK

Captain Perley C. Skillings, of Station 14, Brighton, is enthusiastic about the lights. Recently, an hour after the patrolmen left the station for their "first half" of the night, a thoroughly frightened woman called on the telephone, saying that her husband had been drinking and was trying to beat her. The lights flashed over the 30 boxes and in 60 seconds a police officer only a block away was running to the woman's assistance.

The police regulations require a certain amount of street duty for division commanders, and while touring the district Captain Skillings sounded a citizens' alarm in Oak Square, nearly a mile from the station house. In exactly five minutes eighteen of the twenty men available reported at the box in automobiles, commandeered taxicabs, and motorcycles, and on foot.

The signal control desks in the station houses are provided with light signal indicators, time register, telephone, and a map showing the location of all boxes plainly marked. A set of switches provide for flashing whatever number may be desired. Close to the desk is the teletype machine.

At the official test Mayor James M. Curley and prominent citizens of the Brighton district were guests of Police Commissioner Hultman and Police Superintendent Michael H. Crowley. After the red lights were flashed by pushing a lever at the desk, sixteen patrolmen, one sergeant, and one police car reported by police telephone within three minutes from the time the signal lights started flashing. Captain Skillings was in charge of the demonstration, and Patrolman Daniel Donahue was at the control desk.

While other cities have systems of calling policemen by means of lights, it is believed that Boston is the first municipality to make use of a flashing signal indicating the number of the box from which the alarm is sent and where help is needed.

Commissioner Hultman states: "The officers are allowed to do police work largely on their honor, however, the superior officers are always able to get in touch with route officers for the purpose of giving out important information at any time, or checking up on the manner in which the division is being patrolled.

"Under the circumstances this system is preferable to radio communication. Radio messages may be picked up by anyone with a low-wave set and it is not known positively that the officers have received the messages, whereas the lights call the officers within a few minutes into direct telephone communication over private police lines."

The Brighton district now protected by the lights has a population of 41,000 and contains 125 miles of streets.

HARRY BELKNAP.

TRAFFIC CONTROL AND FACILITATION

Conducted by the Institute of Traffic Engineers, 175 Fifth Avenue, New York

Publications Committee: Maxwell Halsey, Chairman, Hawley S. Simpson, Harry H. Hemmings, Arthur G. Straetz

Are Traffic Accidents Caused by Speed?

DURING January of this year, 1,056 accidents occurred on 22 of Detroit's main thoroughfares. An analysis by Lieut. H. McCaske, of the Traffic Survey Bureau, did not reveal an appreciable number due to fast driving, as only 11 drivers were listed as speeders. Unfortunately, in analyses of this type, such figures cannot be taken as all-inclusive. It is possible, as in this case, that some of the 72 cases listed as "Car Not under Control," the 17 "Reckless Drivers," the 27 "Left Scene of Accident," the 9 "Hit Safety Zones," and the 137 "Collided at Intersections," must have involved fast driving. There are, however, enough cases which are not to be regarded as connected with speed to indicate that a large portion of the accidents are not due directly to that cause.

During the fiscal year, 10,822 accidents occurred in Washington, D. C. These were analyzed by the Office of the Director of Traffic. The cause was not stated for 5,731 of these, and 946 were listed "Was Driving Properly." Of the remaining 4,145 accidents, constituting 38 per cent of the total, 22.5 per cent were "Driving Recklessly," 15.8 per cent "Failed to Yield Right-of-Way," 9.7 per cent were "Turning in Street," 9.7 per cent were "Driving Carelessly," 6.5 per cent "Skidded," 5.9 per cent "Driving under the Influence of Liquor," 5.3 per cent "Lost Control—Car Ran Away," 4.4 per cent "Backing." Only 1.5 per cent were classed as "Exceeding the Speed Limit."

An analysis of accident records occurring during 5.75 years in New York State shows that "Exceeding the Speed Limit" is the third highest reported action of drivers in accidents, being exceeded by "Did Not Have the Right-of-Way" and "Wrong Side of the Road," respectively first and second. A similar analysis of accidents by the National Safety Council revealed a similar rating of the causes, except that "Exceeding the Speed Limit" was tied for second place with "Wrong Side of the Road." These actions of motorists are followed by "Drove Off Roadway," "Failed to Signal," and "Cutting In," although the percentages differ in the two analyses. Many of these actions may be interpreted as caused by high speeds, although many accidents in these classifications are no doubt due to other causes.

H. C. Burnham, of the Rhode Island Board of Public Roads, reported at the Public Safety Section of the Massachusetts Safety Council, on April 30, 1930, that the reduction of speed apparently resulted in fewer automobile accidents. As the result of technical observations since 1924, it was found that a correlation between speed and accidents existed. It is well known that the monthly variation of accidents reaches a maximum during October, after a steady increase through the summer months. Observations in Rhode Island showed that speeds increased during the summer. By an educational newspaper campaign and specific warnings to fast drivers. The fall accident peak was eliminated and total deaths dropped below the 1923 figure.

In Kansas City, Mo., a new ordinance was passed on April 13, 1931. T. J. Seburn, City Traffic Engineer, states that the principal changes include the incorporation of fixed maximum speeds, briefly summarized as follows:

a. After stopping at a "School-Stop" sign, proceed at a speed not greater than 15 miles per hour through the school area or zone.

b. Not to exceed 35 miles per hour on any street where the buildings facing on or alongside of either side of said street are closer together than 150 feet apart or where street intersections are closer together than 400 feet apart.

c. A maximum speed of 45 miles per hour on any street.

These fixed maximum speeds were placed in the traffic code when the enforcement department found it very difficult to obtain convictions for excessive speed under the previous ordinance. It appeared that a motorcycle policeman was unable to take notice of the facts, which would make good evidence, while pursuing a speeder.

It is too soon to measure the effect of the new regulations on the accident situation. To indicate the results of the speed law containing no fixed maximum speed, Mr. Seburn supplied the following data:

During the past seven years the number of fatalities of occupants of vehicles during the first three months of each year averages 5 persons. For the same period of 1931, this figure increased to 16 fatalities to passengers. Occupants injured sufficiently to be sent to the hospital in the same periods of 1930 and 1931 were 120 and 160 respectively. Motor-vehicle fatalities up to and including April 13, 1930, totaled 20, and in the same period for 1931 increased to 37 fatalities.

Rochester Traffic Survey

THE Rochester Engineering Society has just completed its fifth annual traffic survey of the city of Rochester and Monroe County, conducted under the supervision of Leon R. Brown.

The 1931 survey is more extensive than any of the preceding, including a cordon count of all traffic entering the central business area, a comprehensive pedestrian count, and a complete survey of all traffic crossing fifteen Genesee River bridges between Rochester and Avon. Special counts are being made at all intersections where traffic signals have been requested, and a complete analysis will be made of the capacities and actual use of all public and private parking facilities in the city.

The major portion of the field work was done by some 2,000 Boy Scouts, supervised by 25 members of the Rochester Engineering Society. Also cooperating in the survey are the Real Estate Board of Rochester, which is underwriting the cost of printing the survey, and the County Planning Board of Monroe County, which is assisting in the survey outside the city.

Destination Survey of Bus Passengers in Philadelphia

THE questionnaire printed below was used in one phase of a comprehensive bus survey being conducted by Burton W. Marsh, Traffic Engineer, City of Philadelphia, as part of a systematic study of traffic conditions in the central city area.

PLEASE HELP IMPROVE TRAFFIC CONDITIONS

The office of Traffic Engineering, D.P.S., City of Philadelphia, will appreciate your answering Questions 1, 2 and 3. If an "Official Checker" fails to collect this, please drop it in any mail box.

1. AFTER LEAVING THIS BUS, WHERE ARE YOU GOING FIRST IN PHILADELPHIA?

(Fill in one line only)

Street address.....
or Name of store.....
" " " building .....
" " " railroad station .....
" " " hotel .....
" " " theater .....
" Other destination .....

2. WHAT IS PURPOSE OF YOUR TRIP?

(Mark X in the square or squares which apply)

☐ To daily work.....
☐ From daily work.....
☐ Shopping .....
☐ Make a business call.....
☐ Going to catch a train or another bus .....
☐ To theater or other recreation.....
☐ Education .....
☐ Other reason .....

3. IN WHAT CITY OR TOWN DID YOU GET ON THIS BUS?

Do Not Fill Out Below This Line

Company..... Route..... Time.....

This questionnaire involved 1,535 trips of busses carrying 29,000 passengers arriving in Philadelphia from New Jersey on April 8, from 7:00 A.M. to 1:00 P.M.; 79.5 per cent of the passengers filled out the form. The various surveys will enable the Traffic Engineering Bureau to work out a system of bus regulation in the central section that will reduce accidents and congestion.

State of Rhode Island Takes Back Fire, Police and Traffic Authority from City of Providence

UNDER the terms of legislation passed at the January session of the Rhode Island Legislature this year, a Board of Public Safety was created for the city of Providence, which on April 15 took over control and operation of the Police and Fire Departments. The new Board consists of three members, appointed by the Governor with the advice and consent of the Senate. Initial terms of these members are one, three, and 5 years, respectively, and thereafter one member is to be appointed every two years, for a six-year term.

To the new Board were transferred the duties and powers formerly exercised by the Board of Police Commissioners and the Board of Fire Commissioners, and in addition a number of other powers, some of them previously exercised by the City Council. In the matter of traffic control and regulation, particularly, the powers formerly vested in the Mayor, the Board of Aldermen, and the City Council, the Traffic Engineer, or other competent authority concerning the regulation and control of traffic in said city, are conferred upon and vested in said Board, which is empowered to appoint the Traffice Engineer, the Public Service Engineer, and the personnel of his office.

The Board is empowered to make all needful rules and regulations for the control of traffic. Provision is made that all ordinances, rules, and regulations, in force at the time the act becomes effective, relative to control and regulation of traffic, shall continue in force until otherwise ordered by said Board.

The new commission took over control on April 15, 1931. The members are Benjamin P. Moulton, Chairman, George T. Marsh, and M. H. Corrigan. Shortly thereafter they appointed Ralph W. Eaton Public Service Engineer and Traffic Engineer. Mr. Eaton has held the former office, with one interruption of a few weeks, since 1918, and has held since 1928, with a similar interruption, the office of Traffic Engineer.

Are Women Safe Drivers?

RECENT statistics for 1930 reveal that 36,301 vehicle accidents occurred in the state of Massachusetts. Trained inspectors investigated, thoroughly and impartially, 4,987, or about 14 per cent, of these accidents and found 755 fatal accidents and 4,232 non-fatal cases. This analysis is said to be one of the best studies of automobile accidents ever made in the United States.

A human interest question often raised is the comparative safety of men and women as drivers. Excluding 56 drivers whose sex was not recorded, 628 accidents were experienced by women and 6,727 by men, hence women were involved in 8.5 per cent of the accidents.

As female drivers constituted about 20 per cent of all the drivers on the state roads and had only 8.5 per cent of the accidents investigated, the analysis proves favorable to women.

Even allowing for the smaller annual mileage driven by women and the less difficult traffic which they encounter, Major G. A. Parker, Registrar of Motor Vehicles in the Commonwealth, believes the data to indicate that women drivers, as a class, are somewhat safer than men. The conclusion is qualified, however, by the facts that men were at fault in 42 per cent of their accidents, compared with a corresponding 53 per cent for women.

Interesting data paralleling this analysis are available from the State Department of Motor Vehicles of Connecticut. From annual reports of the Department, the following table was prepared:

Report of the year	1927	1928	1929
Per cent of women drivers registered	20.0	19.8	18.2
Per cent of accidents experienced by women	7.5	8.1	8.5

From these percentages, which agree closely with those for Massachusetts, it will be seen that the proportion of women drivers has been decreasing while the percentage of accidents experienced by them has increased slightly.

Similar data from the District of Columbia show that women experienced 7.2 per cent of the accidents during the fiscal year 1927-1928, and 7.9 per cent for the following fiscal year. Data in the 1930 Facts and Figures published by the National Automobile Chamber of Commerce from compilations by Hanff-Metzger, Inc., show that the percentage of women drivers in the District varies from 15.0 to 25.8 per cent of the total drivers.

In New York State, the percentage of accidents involving women drivers was 3.5 per cent of the total number occurring in 1925. This percentage increased to 4.3 in 1930.

Toledo's Synchronized Control System Changed to the Progressive Type

THE new system in Toledo controls traffic lights so that vehicular traffic may travel without interruption from one end of the business district to the other at a speed of 16 miles per hour. This delights many motor-vehicle operators.

Superintendent J. T. Greene of the Division of Fire and Police Alarm Telegraph, states that the system is probably controlled differently from any other in the country. Direct current is used, and two No. 14 wires from the control board lead to the street to be controlled. Polarized relays and pole changes reverse the current and give two changes on red and green. Current is sent in one direction only on the amber circuit for the few seconds that are necessary.

Should a fire or other emergency arise, a switch may be thrown to open the red and green circuits and to reverse the current in the amber circuit, which then shows red in all directions.

An A. C. Traflex system manufactured by Crouse-Hinds is located in the central office with a master timer and one timer for each street. The a.c. timers operate the direct current-control circuits.

Current for the traffic lights located on corners is obtained from local sources of power.

Membership Applications

THE Secretary reports that applications for membership in the Institute have been received from the following in the period April 15 to May 15:

B. Laberge, Traffic Engineer, City of Montreal, Canada.

E. B. Lefferts, Manager, Public Safety Department, Automobile Club of Southern California, Los Angeles, Calif.

Theodore T. McCrosky, Planning Director, City Planning Commission, Yonkers, N. Y.

Joseph G. Regan, Traffic Control Specialist, General Electric Co., Schenectady, N. Y.

Graeme Reid, Traffic Engineer, Public Service Coordinated Transport, Newark, N. J.

Foreign Traffic

THE Publications Committee is developing a group of foreign reporters and intends to keep its readers advised of important current developments.

Automobile Registration in Vienna, Austria

ACCORDING to a recent newspaper item, there are at present in the city of Vienna, the capital of Austria, about 11,500 passenger cars, 12,500 motorcycles and 6,500 trucks.

For a city of almost 2,000,000 inhabitants, this number of motor vehicles seems extremely small and is a true indication of the very bad economic conditions.

The comparatively large number of motorcycles is due to the fact that most of the deliveries of goods are made in side cars or small bodies attached to motorcycles.

More Fatal Road Accidents in Great Britain

DURING 1930 there was a big increase in street accidents in Great Britain and in the number of persons killed or injured in such accidents over the totals recorded for 1929, as reported by the Home Office.

The number of road accidents last year was 156,793, compared with 151,801 in 1929. In last year's accidents 7,305 persons were killed and 177,895 were injured, the figures for 1929 being 6,696 and 170,917 respectively. The number of persons killed or injured last year totaled 185,200 compared with 177,613 in 1929, an increase of 7,587.

The principal causes of the accidents last year were:

	Killed	Injured
Private cars	1,882	55,458
Motorcycles (with pillion passenger)	699	15,222
Motorcycles (without pillion passenger)	1,110	27,287
Motorcycles (with sidecar)	245	6,555
Motor omnibuses and coaches	938	11,332
Motor vans and lorries	1,492	21,547
Pedal cycles	574	27,576

The Metropolitan police area, with its huge population, easily heads the list with 1,398 persons killed and 55,827 persons injured.

Water Rates and Regulations

Part II

Water-Meter Rates

Hydrant Rentals and Sprinkler Charges

Regulations Covering Taps and the Installation of Service

(Continued from the May issue)

Tucson, Ariz.—32,506

For the first 5,000 gallons of water registered by the meter, the municipally owned Water Department makes a charge of 30 cents per 1,000 gallons and for each additional 1,000 gallons 12 cents is charged. The minimum meter rate is $1.50 per month. The city is at present 87 per cent metered, with the plan in view of complete metering before December, 1932.

The rate per hydrant as charged against the City Fire Department for fire usage is $2 per month.

For sprinkler systems the charge is made on a flat rate, depending upon the size of the building.

The charges for installation of services from the main line up to the meter, which is set at the curb line at the expense of the city, are as follows:

Size of Service	On Unpaved Streets	On Paved Streets
¾"	$30.00	$60.00
1"	50.00	80.00
1½"	90.00	120.00
2"	130.00	160.00

For sizes larger than 2-inch, the actual cost of labor and material in installing the service and replacing the pavement is charged, plus 10 per cent. These charges, which are estimated by the Water Department and paid before installation, include the service connection complete, except where meters are required under a sidewalk excavated to the curb line, in which case the property owner is required to construct a suitable cement box with cover for the meter.

Fayetteville, Ark.—7,394

SERVICE CHARGES

Size of Meter	Per Month
Without meter	$0.75
⅝"	0.75
¾"	1.13
1"	1.50
1½"	2.25
2"	3.75
3"	7.50
4"	11.25
6"	22.50

METER RATES

Gallons per Month	Per 1,000 Gallons
First 30,000	$0.52
30,000 to 300,000	0.38
Over 300,000	0.17

In case of non-payment of water rates within ten days after due, the supply will be discontinued and will not be restored again until full and satisfactory settlement has been made. Where water is turned off for non-payment of meter charges, violation of rules or any other cause, 50 cents will be charged to cover the cost to the city. A 10 per cent discount is allowed for payment before the 10th of the month.

No charge is made for public hydrant rental, since the plant is owned by the city, but operated by a special board.

No charge is made for private fire protection within the city limits. Outside the city limits the customers are metered and the regular charge for water used, is made.

Alhambra, Calif.—29,472

All water for domestic, industrial and commercial use served within the city by the Alhambra Water Department is subject to the following charges:

Size of Meter	Per 100 Cubic Feet per Month	Minimum Water Used	Minimum Monthly Charge
⅝"	12½c	800	$1.00
¾"	12½c	1,000	1.25
1"	12½c	1,200	1.50
1½"	12½c	1,600	2.00
2"	12½c	2,000	2.50

All sizes minimum to 10,000 cubic feet at 10c per 100 cubic feet.

All sizes over 10,000 cubic feet at 9c per 100 cubic feet.

The Water Department may attach a meter to any service or service pipe at any time it shall be deemed expedient to do so, and render corrected bill from the date of installation according to the meter rates. All services and meters installed by the Department remain the property of the Department and are maintained, repaired and renewed by the city when rendered unserviceable through fair wear and tear.

Public fire hydrants are placed, maintained and repaired by the Water Department at cost, plus 10 per cent per year for administration, this cost being paid out of the general fund or other fund appropriated for that purpose.

Where pipes are provided for private fire protection, a charge is made, covering time and material, plus 10 per cent overhead. Wherever it is necessary to install a meter, the cost of the meter is included in the charge.

Application must be made to the Department for the installation of services, which is charged for at the following rates:

	Unpaved Streets and Alleys	Paved Streets and Alleys
¾" service	$12.00	$20.00
With ⅝" meter	15.00	27.50
1" service	15.00	25.00
With 1" meter	20.00	30.00
1½" service	25.00	40.00
With 1½" meter	30.00	45.00
2" service	42.00	50.00
With 2" meter	55.00	60.00

Services larger than 2-inch are charged for at the cost of material and labor used, plus 10 per cent for supervision. This charge is due and payable as soon as the work is completed.

All shut-off valves are installed by the city for the use of the Department. For ordinary usage consumers must provide their own valves.

Corona, Calif.—4,129

Each of the following minimum monthly charges made by the Corona City Water Co. entitles the customer to the quantity of water which that charge will purchase at the monthly quantity rates:

Size of Meter	Per Month
⅝"	$1.25
¾"	1.75
1"	2.50
1½"	4.50
2"	6.00
3"	10.00

METER RATES

Cubic Feet per Month	
First 600 or less	$1.25 minimum
	Per 100 Cubic Feet
Next 1,400	16c
" 3,000	13c
" 10,000	10c
Over 15,000	8c

Water used by the city for street sprinkling and sewer flushing by computed or measured quantity, 8c per 100 cubic feet

For each fire hydrant owned by the city installed on 4-inch or larger pipe main	$1.50
For each fire hydrant owned by the company on a 4-inch or larger pipe main	2.00
For each fire hydrant owned by the city on smaller than 4-inch main	0.50
For each fire hydrant owned by the company on smaller than 4-inch main	0.75

San Francisco, Calif.—634,394

The rates authorized by the Board of Supervisors of the City and County of San Francisco applying to domestic, commercial, industrial and general uses in both the San Francisco and suburban districts, are as follows:

SERVICE CHARGE

Size of Meter	Per Month
⅝"	$0.78
¾"	1.20
1"	1.80
1½"	3.00
2"	5.40
3"	9.60
4"	15.00
6"	30.00
8"	48.00

WATER RATES

Cubic Feet per Month	Per 100 Cubic Feet
First 3,300	28.8c
Next 30,000	25.2c
Over 33,300	21.6c

For straight automatic fire sprinkler service, to which no connections for other

purposes are allowed, which are regularly inspected by the Underwriters and which are connected to an alarm system or are otherwise protected against theft, leakage or waste of water, the following rates apply:

SERVICE CHARGE

Size of Meter	Per Month
4"	$9.00
6"	15.00
8"	24.00

For water based on monthly readings, the general use schedule above applies.

The Department will install at its own expense adequate service connections from its mains to the opposite curb line of the street in which mains are located, provided the service is for immediate and permanent use and provided no extension of the Department's distributing mains is necessary. The Department will also provide the proper size meter or meters and install them on the service inside the curb line or as near the curb line as possible.

The owner of the property to be served must install a control valve on the house pipe between the Department's meter and the first fixture outlet on the premises.

Where the size of the main permits, the Department will install at its own expense private fire pipe connections from its mains to the curb line of the property, together with the necessary meters. Where the size of the main is less than the size of sprinkler service required, the consumer will be required to pay all costs of main extension; credit to be given for the difference between four times the estimated annual revenue from the maximum size sprinkler service on the existing main, and four times the estimated annual revenue from the proposed new sprinkler service.

Brush, Colo.—2,306

Gallons per Quarter	Per 1,000 Gallons
First 10,000	25c
Next 10,000	20c
Over 20,000	15c
Over 300,000	10c
Minimum charge per quarter	$4.50

There are no private fire services in the town. Taps in mains and services to property are installed to the sidewalk line by the town for a flat charge of $23 for a ¾-inch service.

If the water bill is not paid promptly the water is shut off and a charge of $1 is made for turning it on again.

Clinton, Conn.

The Guilford-Chester Water Co., which serves the towns of Guilford, Madison, Clinton, Westbrook, Old Saybrook, Essex, Deep River and Chester, makes the following charges:

DOMESTIC METER RATES IN CHESTER DIVISION

Gallons per Quarter	
4,000 or less	$4.00 minimum

		Per 1,000 Gallons
Next	4,000	40c
"	10,000	30c
"	5,000	25c
"	5,000	20c
"	10,000 or more	15c

DOMESTIC METER RATES IN GUILFORD DIVISION

8,000 or less	$8.00 minimum

		Per 1,000 Gallons
Next	2,025	30c
"	5,025	25c
"	5,025	20c
"	9,975	15c
Over	32,250	10c

MONTHLY RATES FOR BOTH DIVISIONS

(applying to all meters except those in family or domestic use)

Gallons per Month	Per 1,000 Gallons
First 37,500	24.75c
Next 37,500	15c
" 75,000	11.25c
" 150,000	7.5c
Over 300,000	6c

MINIMUM CHARGES

Size of Meter	Per Month
⅝" or ¾"	$1.25
1"	1.87
1½"	2.50
2"	3.12
3"	4.37
4"	6.25
6"	8.33

PRIVATE HYDRANT RENTALS

	Per Year
First hydrant	$25.00
Next 5, each	20.00
" 5 "	15.00
Over 11 "	10.00

SPRINKLER RATES

Number of Openings	Per Year
First 100 or less	$30.00
Next 200, each	12½c
" 200 "	10c
" 200 "	8¾c
" 200 "	7½c
" 200 "	6¼c
" 200 "	5c

Middletown, Conn.—24,554

Water sold through metered service is charged for under a minimum service charge and a sliding scale schedule by the city of Middletown. The water works is owned by the 1st District.

MINIMUM CHARGE IN FIRST DISTRICT

Size of Meter	Per 6 Months
⅝"	$2.50
¾"	3.75
1"	5.25
1½"	9.00
2"	15.00
3"	30.00
4"	45.00
6"	90.00

The minimum charge for any water service outside the First District is $7.50 per six months up to and including a 1-inch meter. Where the meter is 1½-inch or greater, the above rates apply.

WATER RATES IN FIRST DISTRICT

Cubic Feet per 6 Months	Per 100 Cubic Feet
First 20,000	12c
20,000 to 150,000	8½c
Over 150,000	5c

All water registered by meter outside the First District is charged at the above rates, plus 20 per cent.

Water rents are due and payable on the first of May and the first of November each year, and to all rents remaining unpaid 20 days after due, 5 per cent is added. If any bill is unpaid after 30 days, notice is given, and unless the bill is paid within 5 days, the water is shut off until the bill and expenses are paid. For all unpaid after 60 days, a lien is placed against the property.

Outside the First District, the hydrant rental is $30 per year. On petition of property owners a hydrant is installed and assessment is made against the property owners benefited, to the total amount of $400.00. The $30.00 charge does not apply in this case. Sprinkler charges outside the First District are $30.00 per year. On all sprinkler services the complete installation is paid for by the owner.

Inside the First District no charge, except the excavation fee, is made for services and taps up to 1 inch. Above 1 inch the difference in cost is paid by the owner. In the Second District, a charge of $30.00 is made for the installation of services up to 1 inch and for those above 1 inch the actual cost is charged, the minimum being $30.00.

Wilmington, Del.—106,597

The city of Wilmington, which is served by the Board of Water Commissioners, is 100 per cent metered, and the following rates apply:

Cubic Feet per Quarter	Per 1,000 Cubic Feet
First 2,000 or less	75c
Next 3,000	60c
Over 5,000	55c

MINIMUM CHARGE

Size of Meter	Per Quarter
⅝"	$10.00*
¾"	15.00
1"	20.00
1½"	30.00
2"	40.00
3"	50.00
4"	60.00
5"	70.00
6"	80.00
8"	150.00
10"	250.00

*This rate applies to properties supplied through a ⅝-inch meter except those having not over two ½-inch outlets, in which case a minimum of $5.00 per year will be charged for which 1,667 cubic feet of water per quarter will be allowed.

Albany, Ga.—14,507

The Water, Light and Gas Commission of Albany, Ga., charges 20 cents per 1,000 gallons for the first 30,000 gallons per month and 10 cents per 1,000 gallons for all over this amount. A discount of 5 per cent is allowed if the bill is paid by the 10th of the month.

MINIMUM CHARGES

Size of Meter	Per Month
⅝"	$0.75
¾"	0.75
1"	1.00
1¼"	1.25
1½"	1.50
2"	2.00
3"	6.00

No charge is made for sprinkler systems or private fire hydrants.

The city taps the main and installs the service pipe from the main to the meter, as well as making all repairs to meters. The following charges are made for installation of services:

Size of Meter	
⅝"	$22.50
¾"	28.50
1"	48.00
1¼"	63.00
1½"	83.00
2"	146.50
3"	274.00

Services requiring more than 100 feet of pipe will be charged for the additional length of pipe over 100 feet. If the pavement has to be broken, the cost of repairing the pavement will be added to the regular charges.

(To be continued in the July issue)

THE CITY'S LEGAL RIGHTS AND DUTIES

Conducted by A. L. H. STREET, Attorney at Law

Treasurer's Accounting

Fees unlawfully collected by a city treasurer held not recoverable by city.

In an action against a city collector and treasurer for an accounting of funds, the Kentucky Court of Appeals said in the case of *City of Princeton* v. *Baker*, 35 S. W. 2d, 524:

"It was also alleged that Mrs. Baker collected or received a large sum for permits issued by her, and retained $224 thereof. . . . It was not alleged that the fees were lawfully collected. If they were not, the city could not recover the amount, as any fees wrongfully collected would be due the parties from whom they were illegally exacted."

Sunday Closing

Ordinance prohibiting motor-vehicle sales on Sunday upheld.

An ordinance of defendant city, prohibiting the selling or exchanging of motor vehicles and the keeping open of such a place of business on Sunday for such purposes, is valid, according to the decision of the Nebraska Supreme Court in the case of *Stewart Motor Co.* v. *City of Omaha*, 235 N. W. 332.

Illegal Purchases

City purchases from company of which a councilman was a member held illegal.

Crescent City, Calif., was not liable on bills of supplies furnished by a company of which a Councilman was manager, decided the California District Court of Appeals in the case of *Hobbs, Wall & Co.* v. *Moran*, 293 Pac. 145. The Court said:

"The statute declares that a transaction consisting of the 'furnishing of any supplies' for a city or town, in which an officer is 'directly or indirectly' interested, shall be void. As manager of the mercantile business, which employment demanded strict loyalty to his employer, it may be inferred Dressler, as a Councilman, was not free to negotiate a bargain in behalf of the city as favorable to the municipality as though these conflicting interests did not exist. Dressler's membership on the Council may reasonably be expected to influence his associates in purchasing supplies for the city. The desire to favor a fellow Councilman, unwarranted confidence, or carelessness in bargaining for supplies, might result in a substantial loss to the city. It is not necessary to show actual fraud, dishonesty, or loss to invalidate the transaction. The purpose of the statute is to remove all indirect influence of an interested officer as well as to discourage deliberate dishonesty."

Sewer Overflow

Village held not liable for sewer overflow not due to negligence.

A village is not liable for damage to private property caused by overflow of a sewer due to extraordinary rainfall that could not have been foreseen and guarded against, there being no neglect in the construction or maintenance of the sewer. (*Power* v. *Village of Hibbing*, 233 N. W. 597, decided by the Minnesota Supreme Court.)

Business Regulations

Ordinance forbidding jewelry auction held to be unconstitutional.

An ordinance of defendant city, forbidding auction sales of any platinum, gold, silver, plated ware, precious or semi-precious stones, watches or other jewelry, was held void in the case of *Korber* v. *City of Portland*, 295 Pac. 203. The measure was held to constitute unconstitutional interference with the right to engage in a legitimate occupation.

An opinion adopted by the Oregon Supreme Court in this case says, in part:

"It is not contended on behalf of the plaintiff that the city has not the right to regulate, license, or tax the sales of jewelry by auction, but he does maintain that the fundamental law of the state and the Union guaranteed to him as the owner of a jewelry store the right to dispose of his stock at auction, subject only to the right of the city to pass reasonable police regulations pertaining to the conduct of such sale, and that a prohibition of this right to sell at auction has no reasonable relation either to the public health, morals, safety or welfare, for the reason that such prohibition cannot be sustained as a measure to prevent deception, because deception may be avoided by regulation."

Public Squares

City may prohibit merchandise sales on public squares and streets.

The rule that "a municipality has the inherent power and right to prohibit by ordinance the barter and sale of all kinds of merchandise on its public square or streets" was re-affirmed by the Texas Court of Civil Appeals in the case of *City of Waco v. O'Neal*, 33 S. W. 2d, 205. Upholding an ordinance forbidding sale or exchange of goods, etc., on a public square, the Court said:

"It is shown that the public square in Waco has been used for seventy-five years or more as a place where farmers and trucksters and stock and poultry raisers could go to buy and sell. The fact that during this long period of time the citizens of the city, county, and trade territory have been extended this privilege does not prevent the governing body of the city from withdrawing this privilege and prohibiting appellees from using said property as a place to display and sell their truck and farm products and their stock and poultry. The present ordinance under consideration prohibits all classes of persons equally from using the public square as a place of business. No class legislation is therefore involved. Whether it is wise for the governing body of Waco to exclude farmers and truck growers as well as other classes from selling on the public square is a matter for its determination. Unquestionably, under an unbroken line of authorities, all of our courts, from the United States Supreme Court down, have held that a city has the inherent power to prohibit any kind of private business from being conducted on the public property."

Street Improvements

Although primary purpose of project is to provide a through highway, abutting property may be assessed for street widening.

Deciding that abutting property could be legally assessed for a street-widening project, Judge Tuttle, of the United States District Court for the Eastern District of Michigan, said in the case of *Posselius* v. *City of Detroit*, 44 Fed. 2d, 395:

"I am unable to agree with the contention of the plaintiffs that, because the primary purpose of this highway project was to provide a through, main thoroughfare across the city, and thus to benefit the general public in such city, it was solely a general improvement, as distinguished from a local improvement, so that entire cost must be defrayed from general taxes and no part of such cost could legally be assessed specially against the land abutting on such highway."

Proper Park Uses

Log cabin representing pioneer home and used by societies collecting historical data, etc., held not to divert use of land from park purposes.

An unsuccessful attempt to compel removal of a log cabin from a municipal park was made in the case of *Vale* v. *City of San Bernardino*, 292 Pac. 689. It was claimed that maintenance of the cabin amounted to a diversion of the park from dedicated purposes. The objection to the cabin centered largely about its use by the Grand Army of the Republic, the Women's Relief Corps, and Spanish American War Veterans. In disposing of the case the California District Court of Appeals said:

Important Legal Decisions

involving municipalities, as reported in this department during 1930, are indexed and classified in the 1931 Municipal Index, just published. This reference list, commencing on page 147 of the 1931 Index, supplements similar lists appearing in the 1930 and 1929 volumes, while the 1928 Index contained a list covering 1924 to 1927, inclusive.

"In the instant case, the log cabin in question has been used for many years; it is a replica of a typical pioneer home and in itself constitutes an exhibit commemorative of pioneer days, fully equal in historical, inspirational, and educational value to a good many exhibits in museums which are recognized as a legitimate part of a public park. It constitutes both a monument and a memorial which have a fitting place in a public park."

Advertisement Distribution

Ordinance prohibiting deposit of handbills, etc., on private property upheld.

An ordinance of defendant city forbids placing of handbills or other advertising matter, excepting newspapers, etc., in any automobile, in any yard, on any porch, or in any mail box. Upholding the validity of this ordinance, the California District Court of Appeals said in the case of *Sieroty* v. *City of Huntington Park*, 295 Pac. 564:

"We think it a matter of common knowledge that, when an individual finds his mail box stuffed with something in which he has no interest and which the receptacle was not made to receive, his frame of mind is such that the offending publication is usually given to the wind very promptly, resulting in the probability of its reaching a destination in the street or alley or on the sidewalk; so we cannot say that the Council has gone beyond its jurisdiction in prohibiting the deposit in mail boxes of a publication that is so likely to be detrimental to the public by reason of its content. . . .

"The Council has selected the four places where deposit of a publication in which the householder is not interested would most likely result in the very thing the ordinance is directed against. There is nothing to prevent distribution to the householder at the door if he is interested in the publication, or to individuals, and appellant could probably obtain the consent of interested householders to deposit the publication on their porches or in their mail boxes, or could change the form of his publication so as to bring it within the excepted classes."

Paving Materials

Specification of patented material for paving, available to all bidders, did not violate competition requirement.

An award of a paving contract at $14,393, under specifications requiring use of a patented material, Amiesite, was valid, as against a bid of $11,903 for asphaltic concrete paving not covered by the specifications, although the city charter requires competitive bidding. In reaching this conclusion in the case of *Beckwith* v. *City of New Rochelle*, 245 N. Y. Supp. 21, the Appellate Division of the New York Supreme Court said:

"The plaintiff's theory appears to be that the calling for a patented article, in the specification, precludes actual competition among the bidders, and therefore prevents reduced prices for work resulting ordinarily from competition, and consequent presumptive and actual injury to the taxpayers, who, in that event, have a right to resort to the courts for relief and protection. . . . This would be true, undoubtedly, if Amiesite, at the same price, was unavailable to all bidders."

Municipal Contracts

Privilege of displaying advertisements in municipal street cars held to come under leasing ordinance.

When the city of Phoenix, Ariz., took over the local street-railway system, it for a time recognized a privilege in an advertising company to continue display of advertisements in the street cars, under an unexpired contract that had been made with the preceding owner of the railway. When the city gave notice of termination of the privilege and intention to call for bids for the advertising rights, the advertising company sued to enjoin interference with its carrying out the contract.

The Arizona Supreme Court decided (*Barron G. Collier, Inc.*, v. *Paddock*, 291 Pac. 1000) that the city acted rightfully, by ordinance, and the advertising company's contract had not been recognized by ordinance. The Court further decided that the city did not lose its right to terminate the advertising company's privilege through having permitted it to be enjoyed for a time after the city took over the railway. The Court said:

"It is true that one who takes over a contract or deliberately enters into relations with one of the parties thereto that are inconsistent with any theory except the adoption of it and then acts in such a way 'as to lead such party to believe that he has made the contract his own . . . . will not be permitted afterward to repudiate it.' 13 C. J. 243. . . . However, before this result may follow, it is necessary not only that the party taking over the contract or entering into such relations with the other party to it have the right to accept or reject it, 21 C. J. 1206, but it must also be true, when the person it is claimed has accepted is a municipality whose charter contains provisions governing its action in this particular, that the contract has been entered into in the manner prescribed by that instrument."

Automobile Regulation

Ordinance limiting sirens to fire and police vehicles upheld.

Oklahoma City has an ordinance forbidding any vehicle to be equipped with a siren, excepting fire apparatus, police cars and emergency cars of the city. City vehicles are to be so equipped upon order of the city manager only. Upholding this measure, against objection of an owner of a privately owned ambulance service, the Oklahoma Supreme Court said (*Ex parte Hall*, 294 Pac. 823):

"The purpose in giving ambulances the right-of-way and requiring other vehicles to pull to the curb and stop is for humane reasons; it being in the mind of the legislative authority that the ill or injured conveyed by ambulance should reach a place for medical attention in the shortest possible time. But giving an ambulance the right-of-way is one thing and prohibiting it from disturbing the repose and quiet of the city by the unearthly shiek of a siren is another thing. . . . Restrictions are necessary and reasonable now which would have been unnecessary and unreasonable in the days of the horse-drawn vehicle. . . . The loud, piercing, shrill and screaming noise of a siren excites the average person operating an automobile. Some other signal with a modified, less objectionable tone should be substituted."

Sinking-Fund Diversion

Borough sinking-funds not subject to diversion as temporary loan. Interest on bank-balances belong to municipality.

Council of a Pennsylvania borough had no right to divert money in a sinking-fund, although for the purpose of avoiding a temporary loan, held the Court of Common Pleas for Luzerne County, on the *Appeal of Auditors of Hughestown Borough*, 22 Pa. Munic. Law Rep. 97. It was further decided that interest on bank balances on deposits of municipal funds belongs to the municipality and not to the official making the deposit.

City Depositaries

City council's designation did not relieve treasurer and his sureties from liability for his neglect resulting in loss of funds.

A city suing its treasurer and his sureties for funds lost in closing of a bank of which he was president was not debarred to recover because the city council designated that bank as depositary, if the loss was due to his lack of good faith and prudence in permitting the funds to remain in the bank on the verge of its insolvency. (*City of Estelline v. Calef*, 234 N. W. 597, decided by the South Dakota Supreme Court.)

Obstruction of Access

Abutting property owner held entitled to enjoin obstruction of access caused by boardwalk.

A real-estate company, owning land on the oceanward side of an avenue in a New Jersey city, was entitled to enjoin the city from maintaining a boardwalk 40 feet wide along the avenue for a distance of nearly one-half mile, in such a manner as to prevent access to and from such lands. (*George W. Armbruster, Jr., Inc., v. City of Wildwood*, 41 Fed. 2d, 823, decided by the United States District Court for the district of New Jersey.)

Water-Main Location

Municipal authorities have exclusive control over location of municipal water pipes.

Officials of a municipality being vested with exclusive discretionary power in locating pipes connected with a municipal water-works system, the courts cannot control the exercise of that power when the city seeks to condemn land in which to lay such pipes. (*In re City of Syracuse*, 243 N. Y. Supp. 160, decided by referee in condemnation proceeding.)

Electric Lighting Costs of New York Municipal Plants

THE St. Lawrence Power Development Commission, appointed by Governor Franklin D. Roosevelt to investigate and report on public development of the power resources of the St. Lawrence River, delegated the technical study of the distribution and sale of St. Lawrence power to a Marketing Board consisting of Dr. John Bauer and Colonel John P. Hogan. A valuable by-product of the work of this board, contained in its report, which was issued early in 1931, was a study of the cost of electric power production and distribution in municipal electric systems in New York State, in which Frederick L. Bird collaborated. This is set forth in a three-page table built up from the Public Service Commission reports for the year 1928, and includes data for 49 municipal systems out of 52 in the state (information for the other three being incomplete). The totals follow:

1.	Population	227,555
2.	Energy sold, kwh.	76,459,437
	Fixed capital:*	
3.	Production and transmission	$3,848,783
4.	Distribution	4,712,413
5.	Total	8,561,196
6.	Production and transmission expenses (including power purchased)	1,282,649
7.	Per kwh. sold	1.68c
8.	Interest and depreciation on production and transmission capital (8% on item 3)	$307,903
9.	Per kwh. sold	0.40c
10.	Total cost of production and transmission	$1,590,550
11.	Per kwh. sold	2.08c
12.	Distribution expenses (total operating expenses less item 6)	$541,117
13.	Per kwh. sold	0.71c
14.	Interest and depreciation on distribution capital (8% on items 4)	$376,993
15.	Per kwh. sold	0.49c
16.	Total cost of distribution	$918,110
17.	Per kwh. sold	1.20c
18.	Total cost	$2,508,660
19.	Per kwh. sold	3.28c
20.	Operating revenue	$3,389,915
21.	Per kwh. sold	4.43c

* General items were allocated on the basis of segregated items.

NOTE.—Unit costs were computed on the basis of kilowatt-hours distributed, the amount of current being estimated for plants that do not meter their service to the municipality. Because of a widely varying practice in the provision for depreciation, and the absence from the accounts of allowance for interest on the investment other than interest on long-term debt, costs for the two items were arbitrarily taken at 3 per cent and 5 per cent, respectively.

The average population of the 49 municipalities is 4,644, the individual populations ranging from 45,172 in Jamestown, to 39 in the village of Dering Harbor. In 13 the population is less than 1,000. Despite the smallness of the municipalities and the fact that the business of the municipal systems in general is predominantly lighting rather than power, the average cost per kilowatt-hour sold, including capital charges whether actually incurred or not, was only 3.28c.

In five places of less than the average size, the cost, as computed, exceeded the revenue; but for the group as a whole, the average revenue of 4.43c per kwh. is well above cost, leaving a surplus of 1.15c for improvements, amortization or other uses. Of further significance is the figure for distribution cost, 1.20c per kwh. sold, including interest and depreciation on distribution facilities, and also including general and miscellaneous expenses.

In Jamestown, which is much the largest of the 49 municipalities, the average cost was 1.78c per kwh. sold, and the average revenue, 2.77c. The cost was made up of 1.12c for production and transmission (including capital charges) and 0.66c for distribution.

In Fairport, which, with its 4,586 inhabitants, comes nearest the average population of the group, the costs were: production and transmission (power is purchased), 1.34c; distribution, 1.21c; total 2.55c; revenue, 3.53c.

For 34 of the municipalities the rates per kwh. for residential consumers are given in the report, for various quantities of monthly consumption. For 20 kwh. they range from 4c per kwh. in Jamestown to 13c in Sherburne (1,077 population); in 19 of the 34 the rate does not exceed 8c.

Rates are also shown for private companies in various parts of the state. For 20 kwh. the lowest rate given is 4c, in Jamestown, where the private company and the municipal plant compete. The next lowest is in Buffalo, 4.75c; in New York City the prevailing rate is 7c; in Syracuse, 7.5c; in Albany and various other cities, 8c; in Long Island and certain up-state cities, 9c; in Yonkers and other Westchester County places, 9.75c, with higher rates in various other cities.

The Municipal Bond Market

By SANDERS SHANKS, JR.

Editor, The Bond Buyer

THE recent sale by the city of New York of an issue of 3 per cent bonds at a premium illustrates the phenomenal advances municipal bond prices have made in recent months. Current quotations for the bonds of the larger cities are higher than they have been for about twenty-five years, the net yield ranging from 3½ per cent to 3¾ per cent on bonds of fifteen years maturity or longer. For the shorter maturities, fantastic prices are being paid, as for instance, the new four-year bonds of New York City. The United States Government's most recent offering of short-term paper was placed at an interest rate of about 1 per cent.

The bond market of today, however, has its unfavorable side. While it is true that there is an insistent demand for the "triple A" bonds, whether municipals, rails or utilities, the issues of less than the choicest grade are not readily salable and have not advanced in price in keeping with the better-grade securities. Even in the municipal classification, investors are treating as of doubtful security bonds of states and large cities that it is quite inconceivable will ever fail to pay principal and interest in full promptly at maturity. And yet, quotations and the actual experiences of investment dealers indicate clearly that the typical investor is not satisfied to place his money in anything but the ultra-conservative type of bond.

How far up the price ladder the so-called first-grade descriptions can go without other good bonds running into a better demand is a matter of opinion, but it seems reasonable to assume that, with the first return of confidence in the general situation investors will be attracted to the many bonds which are now selling at prices showing a disproportionately generous income return.

The following representative list of sales of state and municipal issues indicates the current level of municipal bond prices:

Amount	Municipality	Rate (%)	Maturity	Net Basis (%)
$52,000,000	New York, N. Y.	3	4-yr.	2.997
140,000	Holyoke, Mass.	3½	1-5-yr. (ser.)	3.16
550,000	Northampton Co., Pa.	3⅜	25½-yr. (avg.)	3.69
500,000	Cleveland, Ohio	3⅜	13 1/3-yr. (avg.)	3.71
43,869	Montgomery Co., Kansas	5¾	5¾-yr. (avg.)	3.85
17,000	Jefferson Co., Ind.	4¼	5 1/3-yr. avg.)	3.91
60,000	Haverhill, N. H.	4	10-yr. (avg.)	4.09
10,400,000	San Francisco, Calif.	4½	23-yr. (avg.)	4.13
500,000	Washington Suburban Sanitary Dist., Md.	4½	30-50 (opt.)	4.20
225,000	Albany Co., Wyo.	4½	9 2/3-19 2/3 (opt.)	4.38
48,000	Faulkton, S. Dak., Ind. Sch. Dist.	4½	12½ (avg.)	4.48
199,000	Westwood, N. J., Sch. Dist.	4¾	11½	4.66
169,000	Mobile Co., Ala.	5	16½-yr. (avg.)	4.88
1,000,000	Mississippi	5	5-20 (opt.)	4.90

THE TAXPAYER'S DOLLAR

A Monthly Department of Budgeting, Assessment, Taxation, Accounting and Other Phases of Municipal Finance, Conducted by A. E. BUCK, National Institute of Public Administration, New York

New Jersey Passes Legislation on City Defaults

THE state of New Jersey assumes control of the finances of any municipality within its borders which has defaulted for sixty days or more on its bonds or notes, under a law recently enacted by the Legislature and signed by the Governor. While this law was drafted primarily to bring about improvement in the tangled finances of North Bergen Township, it will apply generally to all communities in the state.

The law provides practical safeguards to holders of New Jersey municipals, since it outlines a definite course of procedure in the case of defaulted securities. It is regarded as being in advance of any legal regulations found in other states. It agrees in general with the recommendations of the Investment Bankers Association of America for supervisory control by state governments over the borrowings of their political subdivisions.

Bonds may be issued by New Jersey communities when in financial difficulties in excess of the state limitation, but only under the control of the State Municipal Finance Commission, specially created by the law for this purpose. This Commission is *ex officio*, consisting of the Attorney General, the State Tax Commissioner, and the Commissioner of Municipal Accounts. It will function automatically in any municipality in default for a stated period, upon petition to the State Supreme Court by any holder of bonds or notes remaining unpaid. The governing bodies of municipalities themselves may bring it into action by reciting in general terms that owing to unusual conditions notes or bonds cannot be promptly met. The Commission has power to prepare and certify to the governing body of any defaulting municipality resolutions providing for the funding or refunding of bonds or notes or other indebtedness of the municipality, and the interest thereon which the commission finds after public hearing to be outstanding and unpaid. At the direction of the Commission, the officials of the municipalities concerned must adopt any resolution providing for the issuance of notes or bonds due a year or more from the date of issue. Such resolutions, and the notes or bonds issued thereunder, are not to be subject to the limitations or provisions of any other act. The Commission will determine the form of the notes or bonds issued for refunding purposes and provide for their sale, execution and delivery. The financial resources of the municipality will be conserved in the meantime by the withholding of authority for the issuance of any obligations maturing in more than one year, save by the assent in writing of the Commission.

The provisions of this act will first be applied in North Bergen Township, where short-term obligations of several millions have been in default for more than a year. Short-term indebtedness of about $7,500,000, added to long-term bonds of about $6,000,000, brings the aggregate indebtedness of this town considerably above the state limitation. Since all figures are based on an assessed valuation, which is only 40 per cent of the actual valuation, North Bergen finances are regarded as not being in a bad plight. However, remedial legislation seems in order, such as this law provides.

Boston Reports a Tax Abatement "Racket"

AS a result of a recent conference with the Board of Assessors and other departmental heads, Mayor Curley, of Boston, announced that there would be a thorough investigation of a so-called tax abatement "racket." Indictments may be sought as a result of the investigation against attorneys and others representing themselves as having influence with the administration in securing tax abatements. Some $150,000,000 of property is involved. About 500 petitions for assessment reduction are under examination, the largest asking for a reduction for 1930 from $8,000,000 to $5,000,000.

According to Mayor Curley, these petitions have been filed by the wealthier class rather than by the small home owner. It is his opinion that the present situation will probably result in an end of abatements, and petitioners will in the future have to seek relief in the courts.

Central Control and Special Assessments Are Problems in Cleveland

THE Citizens League of Cleveland says that both the Council and the Finance Department of that city are now violating the provisions of the charter for the complete centralization of financial control in the Director of Finance. It asserts that such control in the city government is necessary and can be maintained on no other basis.

Under the 1913 charter, the financial provisions of which are practically the same as those of the 1921 charter, providing for the city manager plan, the Director of Finance appointed all accountants and bookkeepers and exercised a strong control over the accounting procedure. Some departments, especially the Public Utility Department, were not altogether pleased, but the provisions were nevertheless enforced. Recently, however, the Director of Finance has become lax to the extent that he permits certain departments to set up accounts in their own way and to select accounting staffs. In this way the accounting control has gradually become decentralized. "The departments ignore the charter requirements," says the League, "the Civil Service Commission accepts the illegal appointments, and the centralized control intended by the charter is deliberately evaded."

An effort has recently been made to overcome the defects of this decentralized system of fiscal control by establishing two new auditing positions, popularly known as "roving auditors," whose duties it will be to check the accounts in the various departments. "In other words," says the League, "having permitted the charter plan of financial control to be completely ignored and violated, the city administration now proceeds to try to remedy the defects of the Finance Department's own delinquencies in this respect by appointing these roving auditors to keep a check on the accountants and bookkeepers in the various departments; while as a matter of practice the control could more easily be maintained by observing the charter requirements and having them appointed by the Commissioner of Accounts."

The Citizens' League also reports that special assessments are a matter of much concern in Cleveland. Suburban towns are threatening to default in their payments because of inability to collect these assessments. Thousands of vacant lots are burdened with special assessments amounting to more than the value of the lots. In ten years special assessments have increased 265 per cent, while general taxes have increased 48 per cent.

Several things have contributed to this situation. Real estate operators have tried to develop subdivisions far beyond existing needs. Public officials in charge of improvements have wanted to make a big showing. Defective state laws did not furnish proper safeguards to protect taxpayers and property owners from the temptation on the part of public officials to lay burdensome special assessments.

Two serious defects in the existing special assessment laws should be overcome, says the League: (1) insufficient notice and inadequate information is given to the individual property owners about projected special assessments; (2) there is temptation under the law, especially in the case of sanitary improvements, for promoters and public officials to undertake improvements which might be postponed or dispensed with entirely.

The League urges that the time has come for a rewriting of Ohio's assessment laws. It suggests that a commission be appointed by the Legislature to undertake the task and report to the next session. In the meantime it cautions public officials to move slowly in burdening the property owners with more special assessments.

Cost Sanitation Records Installed in Brunswick, Ga.

THE first installation of the recording and costing proposals of the Committee on Uniform Street Sanitation Records has recently been completed in Brunswick, Ga. This city has all types of street sanitation, and also has an excellent budget system which is being administered by City Manager E. C. Garvin. The installation was made by Donald C. Stone and G. A. Moe of the Committee's staff. It included the establishment of cost standards for each activity and the preparation of a work program for the current year.

An article describing this installation will be found at pages 105-106 of this issue.

Assistance Given in Budgeting Small Municipalities

THE League of Kansas Municipalities, of Lawrence, Kans., has recently announced that it will furnish consulting services to cities, counties and school districts within the state in the preparation of their budgets. It has prepared complete sets of estimate forms for use by the budgeting authorities of cities, counties and school districts. These forms are in conformity with the provisions of the state laws governing budgeting in the various subdivisions of the state. They may be purchased from the League at a nominal sum. Each set carries full instructions for preparing the estimates.

The League offers its services in installing local accounting systems and in making the periodic audits required under the Kansas law. It maintains a staff for these purposes.

Indiana Legislature Lacks Constructive Attitude Toward Local Governments

THE past legislative session in Indiana produced little of constructive results in relation to local government, according to Professor Frank G. Bates of Indiana University, Executive Secretary of the Municipal League of Indiana. It passed only one act of general municipal interest, and that of negative character.

In an attempt to reduce the burdens of taxation, the Legislature decreed that no local taxing unit could, in the years 1931 and 1932, increase the total amount of its budget beyond that which was provided in 1930. Certain minimum amounts for specified purposes imposed by general statute upon the local units of government are repealed for the next year. These units may therefore impose a lower levy, or, if they see fit, none at all.

Kansas City Finances in the Red

THE Kansas City Public Service Institute estimated that the finances of that city were as much as $200,000 in the red at the close of the fiscal year on April 30. At the close of the previous fiscal year there was a deficit of approximately $350,000, of which less than $100,000 was paid during the year just closed. Bonds were issued to pay part of this deficit.

Sinking-funds of the city were again depleted, says the Institute. About $500,000 has been taken from these funds during the past two years and used to pay serial bonds for which taxes were not levied. Approximately $550,000 is to be taken from sinking-funds during the current year for the same purpose. This is done to create a false showing of a low tax rate, so the Institute declares. The general sinking-fund will be $2,500,000 short of enough cash to meet large bond payments in 1935.

The Institute says that bond funds, sinking-funds, water funds, and trust funds have been used for current expenses. Water users have been made to pay part of the deficits. Bonds have been voted for certain purposes and the funds then diverted. Taxpayers are having to make up the sinking-funds which have been depleted. The city administration is unwilling to face the higher taxes necessary to take care of deficits and provide adequately for sinking-funds. The Institute suggests an alternative: reduce operating expenses so as to make a tax increase unnecessary for present operations and present bond retirement.

About Detroit's Financial Outlook

THIS is the subject of one of the "Just a Minute" papers issued by the Detroit Bureau of Governmental Research. It is pointed out that Detroit is, and has been for many years, the best-governed of the larger cities. The tax budget has been kept at $76,000,000 for the fifth consecutive year. Even with decreasing assessments, it is probable that the tax rate for 1931 will not be increased more than 10 per cent. The administration is in the process of developing a three-year financial program, balancing future expenditures with probable revenues. A committee of employees has been appointed in each department to serve with a representative of the Budget Bureau in discovering possible operating economies.

For several years Detroit, in common with other large American cities, has been lax in enforcing its budgetary procedure. Now the city is checking up on itself. An ordinance has been prepared and is now before the City Council providing for the monthly or quarterly allotment of funds, an operating reserve of one per cent, limitation on transfers, and the submission of a periodic report on departmental expenditures to the mayor and the council. A substantial holiday has been declared in the construction of public improvements, so as to relieve the strain on the city taxpayers. An ordinance limiting the use of special assessments has been recommended. It is proposed that local improvements shall not be made in districts in which there is any serious tax delinquency.

The budget for next year takes care of all deficits except those incurred for unemployment relief. Expenditures for such relief will probably total $13,000,000, with about $4,000,000 carried over from the previous period. There will be a probable tax deficiency of $10,000,000. For the first time it may not be possible to sell the city's delinquent tax titles to tax lien buyers.

The Tax Situation in Denver

CLEM W. COLLINS, Manager of Revenue for the city and county of Denver, recently issued a pamphlet on the tax situation in Colorado with special reference to Denver. This pamphlet describes how assessments, levies and collections are made in that state. It discusses what becomes of the tax dollar and gives some reasons why taxes have increased. Certain changes in the state tax laws, which the writer regards as being necessary, are outlined. A general survey of the revenue system of the state is recommended as a basis for action. The writer finally declares that he has no cut-and-dried prescription for the local situation; he merely offers suggestions.

Financial Trouble Again Looms on Chicago's Horizon

THE city of Chicago and Cook County again face a financial crisis, it seems, comparable to that of a year or more ago, when the Citizens' Committee, headed by Silas H. Strawn, came to the rescue of the 114 local governing bodies by raising $74,000,000. This amount enabled the various agencies to pay public employees and meet other pressing obligations.

Although the administration has recently changed, Mayor "Big Bill" Thompson being defeated for reelection by Anton J. Cermak, the financial predicament is very much the same as last year. The principal difference perhaps lies in the fact that the leading citizens are somewhat unwilling to engage in another "rescue." Payrolls are again in arrears. The city treasury is practically empty.

It is doubtful just what expedient the city administration will adopt in obtaining money to operate the government. The local bankers are refusing to advance money because the 1929 taxes have not yet been paid. These taxes were due April 1 of this year, but the State Legislature extended the date of payment to May 15. The city, county, and schools have borrowed all the money they can from their trust funds in an effort to meet payrolls and other current expenses.

The tax anticipation warrants now outstanding for the city, county, Board of Education, and Sanitary District, according to Professor Simon E. Leland, of the University of Chicago, amount to approximately $285,000,000, including some of the warrants of the 1928 issue. The current budget for the city and schools contains about $9,000,000 in interest charges. This burden is about what it was last year. Professor Leland thinks that funding operations of some kind will be necessary to enable Chicago to get through this year.

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3. Bitumuls Penetration Wearing Surface on bridge deck. California State Highway, Mendocino County.

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Why not remember to mention THE AMERICAN CITY?

Prepared by
FRANK B. WILLIAMS
Author of "The Law of City Planning and Zoning"

ZONING and PLANNING NOTES

From Data collected by the Zoning Committee of New York (233 Broadway)

Recent Zoning Ordinances and Statutes

IOWA.—Sioux City, ordinance, March 13, 1931.

MARYLAND.—Baltimore, ordinance, March 30, 1931.

NEW JERSEY.—Fort Lee, ordinance, February 18, 1931.

NEW YORK.—Statutes 1931, Chs. 123, 235 (enforcement of town zoning laws) and Ch. 331 (committee of City Council may hold hearing on amendment of ordinance).

NEW YORK.—Grand Island, ordinance, July 7, 1930.

Delegation of Legislative Authority

FLORIDA.—*State v. City of Jacksonville*, 133 So. 114.—The special zoning act (1923, No. 9783) for the city of Jacksonville provides that the city zoning ordinance shall be enforced and administered by the inspector of buildings under rules and regulation of the city planning commission, which shall also hear and decide appeals and review any order, decision, requirement or determination made by the inspector of buildings in the enforcement of zoning regulations. *Held*, that this is not an undue delegation of legislative powers, being merely authority to apply a policy as expressed by the Legislature to changing factual conditions.

Non-Conforming Use

LOUISIANA.—*State ex rel Hochfelder v. City of New Orleans*, 132 So. 786.—The provisions forbidding structural changes in a building devoted to a non-conforming use are valid.

Residential District—Fraternity House

NEBRASKA.—*City of Lincoln v. Logan-Jones*, 235 N. W. 583.—A building used by a college Greek letter fraternity as a chapter house is not a "residence" permitted by the zoning ordinance of the city in an exclusive residential district.

Board of Appeals

NEW JERSEY.—*Conaway v. Atlantic City*, 154 Atl. 6.—The rule that procedure by statutory appeals as to board of adjustment must be exhausted before appealing to courts is not absolute, but the court has discretion to act in first instance where circumstances require.

Slaughter-Houses

NEW YORK.—*In re Benfish Construction Co.* (Department of Health), Supreme Court, Kings County, reported in *N. Y. Law Journal*, April 21, 1931. This is an application for an order of mandamus requiring the Board of Health of New York City to rescind its action in denying approval of the erection of a poultry slaughter-house on petitioner's property. The Board has adopted a sanitary code by statutory authority, whereby it is provided that the slaughter of poultry shall not be conducted in the city without permit from the Board. A regulation under the code provides that property to be so used must be located "so that all of the property within the area of the 200-foot radius thereof shall be entirely in an unrestricted district" as established under the zoning resolution of the city. The application was rejected on account of the inability of the applicant to comply with this requirement. The petitioner does not raise the issue of the reasonableness of this regulation; the sole claim is that the Board is without power to adopt it.

Held, that the Board has this power. The petitioner's claim of lack of power is predicated upon the theory that the Board is attempting to use the zoning power, which the Legislature has never conferred upon it. This claim has no merit. It is an exercise of the police power, generally invoked in the interests of public health long before zoning powers were conferred upon the Board of Estimate of the city.

The creation of unrestricted districts is equivalent to a determination by the Board of Estimate and Apportionment, in the exercise of its delegated powers, that the preservation of the public welfare did not *then* require that specific restrictions be imposed on the uses of property located in such area. Such determination in no sense curtailed the power of the Board of Health to impose such restrictions whenever in the future the preservation of the public health and welfare should so require. Here there is no conflict of statutes. A legislative intent to divest the Board of Health permanently of its power to adopt police regulations in a situation that may arise in the future—a power possessed and exercised by it many years before the enactment of the zoning legislation—must find clear expression in some legislative enactment. No such intent is disclosed in the zoning legislation. Under the circumstances here shown the Board of Health had power to adopt the regulations here involved, and since the question of power only is raised by the petition, the application for a peremptory writ must be denied. As already stated, the application presents for decision only the question of law as to the power of the Board of Health to adopt the said regulations. There are no allegations of fact tending to show that the regulations so adopted by the Board of Health were arbitrary or unreasonable. Moreover, the general rule is that there is a presumption of the reasonableness of ordinances, and the burden of proof is upon the one raising this ground of objection (*Mayor, etc., v. Railroad Company*, 133 N. Y., 104, p. 11). Since no question of fact is presented, it follows that the application for an alternative writ of mandamus also must be denied.

Approval of Plats—Parks—Water System—Sanitary Conditions—Width of Lots

NEW YORK.—*Matter of Lake Secor Development Co., Inc., v. Ruce*, Supreme Court, Westchester County, April 25, 1931.—The provision authorizing the planning board in its discretion to require a plat to show a reasonable provision for parks as a prerequisite to its approval for record under the town planning law is valid; the statute, however, in authorizing it to require that the land platted "shall be of such a character that it can be used for building purposes without danger to health" does not empower it to require the installation of a water system, although it might have rejected a plat of swamp or bog land.

The requirement that the plat should show lots less than 60 feet in width in width is invalid. This is not the legal way to prevent congestion.

NOTE BY EDITOR.—This is the first case to pass upon the provision of the recent New York Planning Laws requiring plats to show parks. It should be noted that the platter, if he feels that the planning board has made an unreasonable requirement with regard to parks, is given an appeal by the law to the board of appeals, as in the case of unreasonable zoning. The case is the second with regard to the new laws, *Village of Lynbrook v. Caloo*, 252 N. Y. 308, the first.

Private Covenant—Tenement House

NEW YORK.—*Lengend Realty Corporation v. Bocker*, Supreme Court, Kings County, reported in *N. Y. Law Journal*, May 2, 1931. A private restriction forbade, in a given district, "any public bathhouse, slaughter-house" and other uses generally regarded as undesirable in a high-class residential development, and "any building of the character or description known as a tenement house containing more than four families to each lot." *Held*, that what is commonly referred to as an apartment house was permissible, partly on account of the change of the neighborhood and other reasons, and partly because such an apartment house was not originally intended to be excluded. The distinction between a tenement and an apartment was recognized at the time the restriction was framed and imposed; and while the definition of the words "tenement house" in the Tenement House Law included, and still includes, an apartment house, that definition was expressly stated in that law to be "for the purpose of the chapter" or law in question.

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MUNICIPAL AND CIVIC PUBLICATIONS

Prices quoted do not include postage, unless so stated.

The Municipal Index

The Municipal Index, Edition of 1931.—*The American City Magazine Corporation, 470 Fourth Avenue, New York. 471 pp.*

The policy of the editors and publishers of this standard municipal year book and buyers' guide to make each new edition of increased practical usefulness is apparent in the 1931 issue, in its substantially increased size, simplified indexing, and new features added. As in former years, a section is devoted to each important department or service of local government, with substantial illustrated articles by outstanding authorities, bibliographies, and important miscellaneous material. The 17 sections this year are: Maps and City Lists; Government and Administration, Planning, Finance, Law; Public Buildings and Comfort Stations; Street and Road Construction and Maintenance; Street Cleaning and Snow Removal—Motor Trucks; Street and Highway Traffic; Water-Supply and Purification; Swimming Pools and Other Public Bathing Places; Electric Lighting and Power; Sewers, Sewerage and Sewage Disposal; Garbage, Ashes and Rubbish Collection and Disposal; Fire and Police Departments; Parks and Playgrounds; Airports and Aviation; Directory of Consultants; National and State Organizations; Lists of Municipal Officials and Their Salaries.

Features in which illustrations predominate include: The Architecture of Public Buildings and Comfort Stations; Recent Swimming Pool and Bathhouse Design; Street Cleaning and Snow Removal; Progress in Acquisition of Parks and Playgrounds.

Under the heading, Electric Light and Power "Some Problems of Municipal Operation" are discussed, including "Power Supply," "Operating Relations and Policies," "Accounting Requirements," "Rates," and "Outdoor Lighting." The section on Water Supply and Purification contains four authoritative and well-balanced articles: "Underground Water—Location and Development," by J. R. Pennington; "The Place of Aeration in the Purification of Water," by Malcolm Pirnie; "Selecting and Placing Water Meters," by Arthur T. Seaman; " Laboratory Equipment for Small and Medium-Size Water Works," by Harold C. Chandler.

The section on Street and Road Construction and Maintenance contains articles on "The Laboratory Control of Materials for Paving," "Mosaic Surface Bituminous Macadam Construction in Massachusetts," "Proper Methods to Insure a Satisfactory Sheet Asphalt Pavement," "Maintenance of Concrete Pavement," and "Granite Block Paving for Heavy-Haulage Streets."

New census figures are used in the lists of cities presented in connection with the 25-page atlas. Among important tabular data is a combined directory of municipal officials and their salaries. City managers, mayors, city engineers, and water-works superintendents, street superintendents, fire chiefs, and police chiefs are included. Statistics on the collection and treatment of sewage and trade wastes are shown for 1,422 cities, and there is a statistical study covering 221 outdoor municipal pools.

Kansas Taxes

The 1930 edition of the "Tax Rate Book," published annually by the League of Kansas Municipalities, presents tax rates and operation statistics for "the 577 cities, the 577 city schools, and the 105 counties of Kansas." 40 pp. $1.00 a copy; 3 copies, $2.50. (Apply to the League, Lawrence, Kans.)

A Traffic Plan

"A Traffic Plan for the Embarcadero" is the title of an engineering study prepared by the San Francisco Traffic Survey Committee in cooperation with the Special Waterfront Committee of that city, by authority of the State Board of Harbor Commissioners; I. S. Shattuck, Engineer, Miller McClintock, Director. Outstanding features of the plan are discussed by Mr. Shattuck in his article on page 117. 35 pp. $1.25. Illustrated. (Apply to the Committee, 626 Sixty-Eight Post Bldg., San Francisco, Calif.)

A Municipal Review

The Municipal Year Book; 1931.—Edited by Edwin C. Fairchild. Municipal Journal, Ltd., London. 1,220 pp. $5.25, prepaid, from The American City.

The elaborate and carefully edited Municipal Year Book of Great Britain contains, in the new edition, all the usual features and a number of new ones. In addition to sections on local government departments and divisions of England, Scotland and Wales, there are sections on Education; Roads, Transport and Electricity; Electrical Supply; Housing; Open Spaces and Parks; Public Cleansing; Water and Gas Supply; Docks and Harbors; Markets and Slaughterhouses; Public Baths, etc. New British legislation affecting local government is cited, as are changes in government areas. There are directories of officials, and salary data; also a complete list of organizations concerned with local government.

A Village Report

The report of "Municipal Activities" in the Village of Allen Park, Wayne County, Mich., 1928-1930, is an effective and interesting document in its typography, its arrangements, and the presentation of its contents. The Municipal Directory and the tabulation of Outstanding Facts and Accomplishments are followed by a brief historical sketch, and by a section devoted to each department and service. These are in easily readable narrative form. 42 pp. (Apply to Frederick L. Schwass, Village President.)

Prison Reform

The Annual Report of the National Committee on Prisons and Prison Labor, dated April 30, 1931, contains an account of efforts towards the individual treatment of prisoners, and of research into proper methods of housing prisoners. Demonstrations in New York State and New York City looking to the effective operation of the state use principle in prison labor, and to the development of a technique that may be helpful elsewhere, are described, as are other Prison Labor Executive Committee activities, and activities of other special committees. 30 pp. (Apply to National Committee on Prisons and Prison Labor, 250 W. 57th St., New York.)

Land Reclamation

Means to the reclamation of vast stretches of marshy land lying at the doorway to Greater New York are outlined in the report of the Joint Legislative Commission on Meadow Reclamation appointed in 1930. Important among the recommendation are those looking to comprehensive zoning for the entire territory; state highways across the meadow lands; a system of benefit assessments both for highways and for reclamation work in general; creation of a permanent commission to proceed continuously with the work and its financing. 76 large pp.; insert maps. Free for postage, according to zone—9c in N. J.; 23c to Calif., etc. (Apply to State Chamber of Commerce, Newark, N. J.)

Civil Service Law

A "Draft of a City Civil Service Law" and a "Draft of a State Civil Service Law" have been prepared by the National Civil Service Reform League. Each includes the essentials of a well-rounded personnel system. Each has been prepared with the cooperation of authorities in the field concerned. 23 pp. and 31 pp. respectively. (Apply to the League, 521 Fifth Avenue, New York.)

A License Ordinance

Wylie Kilpatrick is the author of "A Proposed Model Ordinance for the Regulation and Licensing of Hawkers, Peddlers, Transient Merchants, and Itinerant Vendors"—a group of small and irregular business men who constitute a problem in almost every community. The outline for legislation is preceded by 10 pages of discussion of legal and ethical points involved. 13 pp. (Apply to Bureau of Municipal Information, New Jersey State League of Municipalities, Trenton, N. J.)

City Planning

Principles of City Planning.—By Karl B. Lohmann, Professor of Landscape Architecture, University of Illinois. McGraw-Hill Book Company. 1931. 400 pp. $4.00 from The American City.

The average citizen interested in appraising the problems of his own community in the light of sound present-day planning practice; the improvement association or civic club; the student and the teacher of city planning; and the municipal official, have all felt the need of such a book as Professor Lohmann has written. This book gives special emphasis to the elements and principles of the various branches of city planning and considers also the scope, importance and possibilities of the work, and means of accomplishment. The historic backgrounds of the movement are briefly sketched in, followed by an account of the city plan as a whole. A separate chapter is devoted to each physical element of the plan, such as streets, railroads, airports, parks; and there are chapters on "Beauty in the City Plan," "Regional Planning in Metropolitan Areas," "Legal Authority for City Planning," "Paying for City Planning Developments," and "Educational and Promotive Work in City Planning." The basic data are thoroughly up to date, current development being used wherever appropriate for illustration and discussion.

Fire Fighting

Fire.—By Thomas F. Dougherty and Paul W. Kearney. G. P. Putnam's Sons, New York. 245 pp. $3.50 from The American City.

Here is a sprightly volume by a rugged and seasoned veteran of the New York City Fire Department, with the aid of a facile journalist. It is replete with lively and gripping stories of actual fire fighting that have the grim ring of truth. Its illustrations, too, are carefully selected and unusually vivid and instructive. The volume is the summary of the practical wisdom gained by Chief Dougherty in a lifetime of fire fighting. It is not particularly clear to exactly what audience this volume is addressed. Several of the chapters are obviously intended for the general public, and the appendix has some practical information about the automatic vent, gas heaters, cleaning fluids and fire extinguishers that any householder would do well to read. Other chapters seem to be intended for the professional or prospective fireman. The whole, however, is put together with such a degree of imagination and lively use of illustrative stories as to make a volume of quite general popular appeal.

Public Health

Twenty rural communities in Saskatchewan, Canada, levy taxes of $7 to $10 per family to engage the services of full-time physicians at annual salaries ranging from $3,000 to $5,000. The plan is regarded as highly satisfactory. Details are given by C. Rufus Rorem, Ph.D., C.P.A., in an abstract of Publication No. 11. 20 pp. (Apply to Committee on Cost of Medical Care, 910 Seventeenth St., Washington, D. C.)

A State Budget

The Ohio state budget document for the biennium 1931-1932 was prepared under the immediate direction of Harvey Walker, Assistant Director of Finance under Governor Cooper's administration. It is an octavo volume of 303 pages. A great deal of explanatory text is included in connection with each state agency, much of which is of a general nature. The text is supported in most cases by organizational charts, which are intended to show personnel rather than lines of administrative authority. The estimates for the future period are presented only in summary form. Two rather unique features of this document are the use of aerial photographs of various institutional plants and the inclusion of cost and other data on the operations of departments and institutions.

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Unemployment

The Problem of Unemployment.—By Paul H. Douglas, Professor of Economics, University of Chicago; and Aaron Director, Instructor in Economics, University of Chicago. The Macmillan Company. 1931. 510 *pp.* $3.50 *from* THE AMERICAN CITY.

Cyclical, seasonal, technological and chronic unemployment are analyzed by the authors in their well-considered presentation of what is at this time the world's greatest economic problem. Possible remedies are offered. The contributions which might be made by public employment offices and by unemployment insurance are examined. The American scene is kept foremost, but European precedent and European experience are cited. "During the last few months . . . a magnificent attempt has been made on an unprecedented scale to relieve widespread destitution [of the suffering millions out of work]," says Frank Aydelotte, President of Swarthmore College, in the preface. "But all this effort . . . has done nothing to cure the disease. Only research jointly conducted by scholars in the libraries and by industrialists in their factories can do that." This book has made a good beginning by presenting in scholarly fashion the elements of the problem.

Megalopolis

The Nemesis of American Business.—By Stuart Chase. The Macmillan Co. 191 *pp.* $2.00 *from* THE AMERICAN CITY.

The complexities and maladjustments of our industrial civilization are diagnosed and prescribed for in this collection of articles by one of the keenest observers and most stimulating writers of our day. Unemployment and overproduction are vividly and searchingly discussed; and the physical shortcomings and monstrosities of the big city—Megalopolis, enthusiastically patterned-after by the little city—are unsparingly laid bare. All points to the need of intelligent, comprehensive planning, of cities and of industry—and a saner appreciation of values in human living.

Civic Art

The combined 40th and 41st annual reports of the City Parks Association of Philadelphia, bound uniformly with reports of former years, constitute a handsome, well-illustrated record of civic esthetics and civic art. It includes articles on the new Philadelphia City Plan Commission, and on city-wide zoning; on the sixth biennial open-air sculptural exhibit; on street widening and improvement; on the appearance of public parking lots, miniature golf courses, etc. 118 pp. (Apply to the Secretary, H. Eugene Heine, 501 Commonwealth Bldg., Philadelphia, Pa.)

Housing and Planning

Part I of the Papers of the Congress of the International Federation for Housing and Town Planning (Berlin, June 1-5), is, as in past years, available in published form in advance of the meeting, and contains summaries of many of the papers. The contents of the 410-page volume, presented in English, French, and German, fall under the three main heads: "The Abolition of Slums"; "The Traffic Problem in Relation to City and Regional Planning"; and "Lessons of Recent Congresses." Lawrence Veiller, Harold M. Lewis, Daniel L. Turner, George McAneny, and Wayne D. Heydecker are represented, for the United States. (Apply to International Federation for Housing and Town Planning, 25 Bedford Row, London, W.C.1, England.)

Housing

Congress Publication No. 2, issued by the International Housing Association in anticipation of the Berlin Congress is a volume of 550 pages, well edited, containing reports from 160 countries on "Social Importance of Housing, Present and Future." The reports cover private, public, and cooperative building and consider present bases for future housing supply. Free to members. (For details of membership apply to Dr. Hans Kanpffmeyer, Hansa Allee 27, Frankfort am Main, Germany.)

Smoke Abatement

"A Brief Bibliography on Smoke Abatement" has been compiled by Roger J. Bounds, Civic Development Department, Chamber of Commerce of the United States. 5 pp. multigraphed. (Apply to Chamber of Commerce of the United States, Washington, D. C.)

Bossism

Master of Manhattan.—By Lothrop Stoddard. Longmans, Green & Co., New York. 276 *pp.* $3.50 *from* THE AMERICAN CITY.

The phenomenon of the American "boss" never ceases to interest. Here is a full-length portrait of Richard Crocker, whom this author calls, and quite rightfully, the one-time "Master" of Manhattan. This biography is approached with no reformist preconceptions. The writer obviously enjoyed, and to no small extent respected, his subject. He is particularly impressed with the development of the character which he finds in this grizzled Tammany chieftain. In many ways he finds him more human and wiser than the reformers who battled against him. The book is therefore worthy of thoughtful reading. It is, moreover, a readable volume, replete with breezy quotations from contemporary sources. It has a good bibliography, and most of its important statements are buttressed with footnotes.

Traffic

Two important articles from the Traffic Section of The Municipal Index, 1931, are available in pamphlet reprint form. These are "Planning Highways and Street Intersections for Modern Traffic Needs," by Burton W. Marsh, Traffic Engineer, City of Philadelphia; and "Methods for Studying Traffic Control Problems," by Dwight McCracken, Albert Russel Erskine Research Fellow, Harvard University; edited by Miller McClintock, Director of the Albert Russel Erskine Bureau for Street Traffic Research, Harvard University. 21 pp. and 18 pp., illustrated. 25c each. (Apply to THE AMERICAN CITY.)

Refuse Disposal

"Refuse Disposal in American Cities" is the title of a 41-page mimeographed pamphlet which describes the principal methods and systems now in practice. Costs of such disposal, costs of the construction and operation of disposal plants, and other information, are given. A compilation of data on the capacity and cost of construction of nearly 600 incineration plants is included, as well as data on the cost of operation of incinerators in more than 150 cities. In addition there is a selected bibliography (with a lengthy section devoted to articles which have appeared in THE AMERICAN CITY). 41 mimeographed pp. (Apply to Civic Development Department, United States Chamber of Commerce, Washington, D. C.)

Police Lectures

The entire series of 35 lectures given at the Police School conducted by the Willamette University College of Law, March 9-14, 1931 (see THE AMERICAN CITY for April, page 133), is available in a book of 75 mimeographed pages. Eighteen lectures from various Pacific Coast cities are represented. $2.50. (Apply to Miss Helen Pettyjohn, 145 N. 14th St., Salem, Ore.)

Street and Sidewalk Privileges

A study of the practice of some of the large cities of the United States in granting to property owners and others the privilege of private use of space over and under streets, has been made by Lucius H. Cannon, Librarian of the Municipal Reference Library, St. Louis, Mo. The results of the study appear in a 35-page mimeographed report, which includes many excerpts of local ordinances for the cities studied, and also of some court decisions. Somewhat over half of the pamphlet applies to the city of Chicago. $1.00 (Apply to the Library, 408 City Hall, St. Louis, Mo.)

Taxing Motor Cars

Under the title, "Taxation of Private and Common-Carrier Motor Vehicles by Municipalities," James W. Martin, Director, and C. M. Stephenson, Assistant, of the Bureau of Business Research, University of Kentucky, have prepared a compact study which appears as Publication No. 3, Statistical Series, Municipal Administration Service. It summarizes the practice of municipalities in the various states with regard to motor-vehicle taxes, and in an appendix gives details of taxes for a considerable number of cities. 12 pp. 15c. (Apply to Municipal Administration Service, 261 Broadway, New York.)

Public Health

The Prevention of Disease in the Community.—By Curtis Hilliard, Professor of Biology and Health, Simmons College; Health Supervisor for Wellesley and Weston, Mass. McGraw-Hill Book Co. 200 *pp.* $1.75 *from* THE AMERICAN CITY.

Methods for the control of communicable disease and for the promotion of public health are concisely reviewed by the author, who is an authority on the subject, and whose book will prove equally valuable to the public health worker and the teacher. The principal subjects covered are: the evolution of the public health movement, with an account of bacteriology as an aid in controlling epidemic diseases; the phenomena of infection and immunity; and the sources of disease microbes and ways and means by which they are spread; the practical application of the facts of immunity; the control of disease in the community and in the home; various insects and their relation to the spread of disease; the importance of "predisposing factors" in tuberculosis and in infant mortality; organization of public health work.

Municipal Studies

A "Selected List of Recent Municipal Research Reports" has just been gotten out by the Municipal Administration Service in the form of an 8-page pamphlet. The various reports, studies, etc., are classified topically. 10c. (Apply to the Service, 261 Broadway, New York.)

Budget Forms

The League of Kansas Municipalities has prepared sets of forms for use in making up budgets for cities, counties and schools. They are on legal-size foolscap punched for binding. While these have been designed to comply with Kansas law, they are also of interest to cities in other states. The city budget forms (18 sheets), are 75c a set; the county forms are the same price, and school forms are 50c. The prices are less in quantities. (Apply to the League, Lawrence, Kans).

Municipal Ownership Chart

The Institute for Economic Research has prepared a large tabular chart (30 x 38 inches) entitled "State Constitutional and Statutory Law Affecting Municipal Ownership of Public Utilities," with particular reference to electric light and power service. References to the constitution or statutes of each state relating to various aspects of municipal ownership of utilities are given under 30 column headings. $1.00. (Apply to the Institute, Chicago, Ill.)

Municipal Cooperation

A 12-page pamphlet describing the origin, organization and activities of the New York State Conference of Mayors and Other Municipal Officials, one of the most active and influential state leagues of municipalities, has been prepared under the title, "Municipal Cooperation and Its Results." (Apply to the Conference, City Hall, Albany, N. Y.)

Other Reports Received

CONCORD, N. H.—Annual Report, Board of Water Commissioners, 1930. 20 pp.

GREAT BRITAIN.—Report on Administration of Road Fund, 1930. 100 pp. 1s net, from H.M. Stationary Office, London, England.

HENNEPIN COUNTY, MINN.—Road and Bridge Department Report, 1930; Comments on Road and Bridge Department Report. 2 publications; 18 pp. and unnumbered pages.

HOPKINTON, N. H.—Annual Report to January, 1931. 88 pp.

MICHIGAN.—Report of the State Tax Commission, 1929-1930. 120 pp.

OAK PARK, ILL.—Annual Report, Department of Public Works, 1930. 80 pp.

OAK PARK, ILL.—Annual Report, Water Department, 1930. 22 pp.

SALT LAKE CITY, UTAH.—Apportionment Budget, for 1931. 20 pp.

SALT LAKE CITY, UTAH.—Auditor's Annual Report, 1930. 61 pp.

WILMINGTON, DEL.—Annual Report, Water Department, Fiscal Year, 1929-1930. 160 pp.

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CONVENTIONS—WHEN AND WHERE

(Figures in parentheses following the name of the convention city indicate the estimated attendance, other than local.)

JUNE 1-5.—BERLIN, GERMANY. (1,000)
International Federation for Housing and Town Planning. Congress. Organizing Secretary, H. Chapman, Zimmer 23, Rathaus, Koenigstrasse, Berlin C, Germany.

JUNE 1-5.—BERLIN, GERMANY. (1,000)
International Housing Association. Congress. General Secretary, Dr. Hans Kampffmeyer, Zimmer 97, Preussiches Wohlfahrtsministerium, Leipzigerstrasse 3, Berlin W. 8, Germany.

JUNE 2-5.—WASHINGTON, D. C. (300)
National Conference on Weights and Measures. Annual. Secretary, F. S. Holbrook, Bureau of Standards, Washington, D. C.

JUNE 3-5.—ASHEVILLE, N. C. (250)
American Forestry Association. Annual meeting. Executive Secretary, Ovid Butler, 1727 K Street, N. W., Washington, D. C.

JUNE 8-13.—LOS ANGELES, CALIF.
Institute of Public Administration. Director, Professor Emery E. Olsen, University of Southern Californa, University Park, Los Angeles, Calif.

JUNE 8-11.—TORONTO, ONT.
National Association of Purchasing Agents. Annual convention and Informashow. Secretary-Treasurer, G. A. Renard, 11 Park Place, New York.

JUNE 8-12.—ATLANTIC CITY, N. J. (10,000)
National Electric Light Association. Annual convention. Secretary, A. Jackson Marshall, 420 Lexington Avenue, New York.

JUNE 8-10.—HOUSTON, TEXAS. (175)
Texas Commercial Executives' Association. Annual convention. Secretary, W. A. Spencer, Chamber of Commerce, Temple, Texas.

JUNE 9-13.—ST. PAUL, MINN. (100)
National Urban League. Annual meeting. Executive, Secretary Eugene K. Jones, 1133 Madison Avenue, New York.

JUNE 9-11.—GLENS FALLS, N. Y. (700)
New York State Conference of Mayors and Other Municipal Officials. Annual convention. Secretary, William P. Capes, City Hall, Albany, N. Y.

JUNE 11-12.—OPELIKA, ALA. 100)
Alabama League of Municipalities. Annual convention. Secretary-Treasurer, M. L. Robertson, Cullman, Ala.

JUNE 11.—DETROIT, MICH. (500)
Union of the Municipalities of the Province of Quebec. Annual convention. Secretary-Treasurer, T. D. Bouchard, 132 St. James Street, Montreal, Que.

JUNE 12-14.—MINNEAPOLIS, MINN. (100)
Association of Community Chests and Councils. Annual meeting. Executive Director, Allen T. Burns, 1815 Graybar Building, New York.

JUNE 12-19.—MINNEAPOLIS, MINN. (300)
National Probation Association. Annual convention. General Secretary, Charles L. Chute, 450 Seventh Avenue, New York.

JUNE 12-18.—STANFORD, CALIF. (125)
Western School for Commercial Secretaries. Annual session. Manager, Leonard E. Read, Chamber of Commerce Building, Seattle, Wash.

JUNE 13-18.—MINNEAPOLIS, MINN.
International Association of Policewomen. Annual conference. President, Mrs. Mina C. VanWinkle, 630 Louisiana Avenue, Washington, D. C.

JUNE 14-18.—NEW YORK. (100)
American Community Advertising Association with the Advertising Federation of Amerca. Secretary-Treasurer, Don E. Mowry, General Motors Building, Detroit, Mich.

JUNE 14-20.—MINNEAPOLIS, MINN.
National Conference of Social Work. General Secretary, Howard R. Knight, 277 East Long Street, Columbus, Ohio.

JUNE 15-17.—LUBBOCK, TEXAS. (300)
League of Texas Municipalities. Annual convention. Executive Secretary, Harvey W. Draper, 319 Kress Building, Houston, Texas.

JUNE 16-18.—TORONTO, ONT.
International Association of Comptrollers and Accounting Officers. Annual meeting. Secretary, Carl H. Chatters, Department of Finance, 816 Fidelity Trust Building, Detroit, Mich.

JUNE 17-19.—REGINA, SASK. (200)
Canadian Public Health Association. Annual meeting. General Secretary, Dr. J. T. Phair, Spadina House, Toronto, Ont.

JUNE 17-19.—ST. CLOUD, MINN. (500)
League of Minnesota Municipalities. Annual convention. Executive Secretary, Morris B. Lambie, Director of the Extension Division, University of Minnesota, Minneapolis, Minn.

JUNE 17-19.—MARSHFIELD, WIS. (600)
League of Wisconsin Municipalities. Annual convention. Secretary, Frederick MacMillin, 114 North Carroll Street, Madison, Wis.

JUNE 18.—MINNEAPOLIS, MINN.
Child Welfare League of America, Inc. Annual meeting. Executive Director, Mr. C. C. Carstens, 130 East 22d Street, New York.

JUNE 19-20.—ATLANTIC CITY, N. J. (600)
Eastern Association of Fire Chiefs. Annual convention. Secretary, F. E. Soule, Coatesville, Pa.

JUNE 19-20.—AKRON, OHIO. (50)
Ohio Commercial Secretaries' Association. Annual meeting. Secretary-Treasurer, Russell Frey, Chamber of Commerce, Lakewood, Ohio.

JUNE 21-22.—WISCONSIN RAPIDS, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Secretary-Treasurer, Lee I. Yorkson, Wausau, Wis.

JUNE 22-26.—ASHEVILLE, N. C. (500)
American Institute of Electrical Engineers. Annual summer convention. National Secretary, F. L. Hutchinson, 33 West 39th Street, New York.

JUNE 22-27.—NEW HAVEN, CONN. (3,000)
American Library Association. Annual convention. Secretary, Carl H. Milam, 520 North Michigan Avenue, Chicago, Ill.

JUNE 22-26.—CHICAGO, ILL. (900)
American Society for Testing Materials. Annual meeting. Secretary-Treasurer, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 22-23.—LAKE WORTH, FLA. (30)
Florida Commercial Secretaries' Association. Annual convention. Secretary-Treasurer, George F. Sampson, Winter Haven, Fla.

JUNE 22-24.—ROCHESTER, N. Y.
National Conference on City Planning. Secretary, Flavel Shurtleff, 130 East 22d Street, New York.

JUNE 23-25.—DURANGO, COLO. (75)
Colorado Municipal League. Annual meeting. Secretary-Treasurer, Don C. Sowers, University of Colorado, Boulder, Colo.

JUNE 23-26.—BOSTON, MASS.
New England Association of Fire Chiefs. Annual convention. Secretary-Treasurer, John W. O'Hearn, 99 Main Street, Watertown 72, Mass.

JUNE 23-26.—CLEVELAND, OHIO, AND LONDON, ONT.
Ohio State Police Chiefs Incorporated. Annual convention. Secretary, E. G. Krause, 1020 Guardian Building, Cleveland, Ohio.

JUNE 24-26.—ESTEVAN, SASK. (100)
Union of Saskatchewan Municipalities. Annual convention. Secretary-Treasurer, W. E. Hodge, 507 Scott Block, Moose Jaw, Sask.

JUNE 25-26.—CALGARY, ALTA. (95)
Union of Alberta Municipalities. Annual convention. Secretary-Treasurer, J. E. Fraser, Wetaskiwin, Alta.

JUNE 25-26.—NEW SMYRNA, FLA. (450)
Florida League of Municipalities. Annual meeting. Secretary-Treasurer, E. P. Owen, 1201-05 Lynch Building, Jacksonville, Fla.

JUNE 25-26.—STATE COLLEGE, PA.
Pennsylvania Water Works Operators' Association. Annual convention. Secretary-Treasurer, I. M. Glace, 506 South Office Building, State Capitol, Harrisburg, Pa.

JUNE 27-JULY 4.—LOS ANGELES, CALIF. (10,000)
National Education Association of the United States. Annual meeting. Secretary, J. W. Crabtree, 1201 16th Street, N. W., Washington, D. C.

JUNE 30-JULY 3.—GRAND RAPIDS, MICH. (300)
Smoke Prevention Association. Annual convention. Secretary, Frank A. Chambers, 1411 City Hall Square Building, Chicago, Ill.

JULY 8-11.—TACOMA, WASH. (450)
American Society of Civil Engineers. Annual convention. Secretary, George T. Seabury, 33 West 39th Street, New York.

JULY 20-26.—LOS ANGELES, CALIF.
International Road Machinery Exposition. General Manager, E. G. Lenzner, P. O. Box 338, Watts Station, Alameda Boulevard at 131st Street, Los Angeles, Calif.

JULY 21-23.—PITTSBURGH, PA. (250)
Pennsylvania Chiefs of Police Association. Annual convention. Secretary, J. N. Tillard, Police Chief, Altoona, Pa.

JULY 27-29.—TROY, N. Y. (300)
New York State Association of Chiefs of Police. Annual convention. Secretary-Treasurer, James L. Hyatt, 14 Hurlbut Street, Albany, N. Y.

AUGUST 2-15.—EVANSTON, ILL.
National Institute for Commercial and Trade Organization Executives. Secretary, John N. Van der Vries, 607 National Bank Building, Chicago.

AUGUST 11-15.—PHILADELPHIA, PA. (1,000)
United States Building and Loan League. Annual convention. Secretary, H. F. Cellarius, 12 East 12th Street, Cincinnati, Ohio.

AUGUST 18-20.—COUNCIL BLUFFS, IOWA.
League of Iowa Municipalities. Annual meeting. Secretary-Treasurer, Frank G. Pierce, Marshalltown, Iowa.

AUGUST 27-29.—YONKERS, N. Y. (200)
National Shade Tree Conference. Secretary-Treasurer, Dr. Rush P. Marshall, Yale University, New Haven, Conn.

SEPTEMBER 12-14.—MONTREAL, QUE. (45)
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, R. E. Tarbett, U. S. Public Health Service, Washington.

SEPTEMBER 14-17.—MONTREAL, QUE. (800)
American Public Health Association. Annual meeting. Acting Executive Secretary, Dr. Kendall Emerson, 450 Seventh Avenue, New York.

SEPTEMBER 24-26.—NEW YORK. (150)
International Association of Public Works Officials. Annual convention. Secretary, A. M. Anderson, 100 North LaSalle Street, Chicago, Ill.

SEPTEMBER 28, WEEK OF.—TORONTO, ONT. (350)
American Institute of Park Executives and the American Park Society. Annual convention. Executive Secretary, William H. Walker, 224 Wakewa Avenue, South Bend, Ind.

SEPTEMBER 29-OCTOBER 2.—BOSTON, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

OCTOBER 5-9.—TORONTO, ONT. (600)
National Recreation Association. Annual Recreation Congress. Secretary of the Recreation Congress Committee, Thomas E. Rivers, 315 Fourth Avenue, New York.

OCTOBER 7-10.—LOUISVILLE, KY., (250)
International City Managers' Association. Annual convention. Executive Secretary, Clarence E. Ridley, 923 East 60th Street, Chicago, Ill.

OCTOBER 12-15.—ST. PETERSBURG, FLA. (400)
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

OCTOBER 12, WEEK OF.—CHICAGO, ILL. (7,000)
National Safety Council, Annual Congress. Managing Director, W. H. Cameron, 20 North Wacker Drive, Chicago, Ill.

OCTOBER 14-17.—HAVANA, CUBA. (1,200)
International Association of Fire Chiefs. Annual convention. Secretary, James J. Mulcahey, Fire Chief, Yonkers, N. Y.

OCTOBER 19-23.—PITTSBURGH, PA. (200)
American Society of Municipal Engineers. Annual convention. Secretary, C. W. S. Sammelman, 4359 Lindell Boulevard, St. Louis, Mo.

OCTOBER 27-30.—JACKSONVILLE, FLA.
International Association of Municipal Electricians. Annual convention. Secretary, W. H. Harth, Columbia, S. C.

NOVEMBER 9-11.—BUFFALO, N. Y.
National Municipal League. Annual convention. Secretary, Russell Forbes, 261 Broadway, New York.

Longest life—40 years not uncommon . . . . .

Lowest maintenance is proved by records . .

For both light and heavy traffic . . . . . .

Preferred on street car lines . . . . . .

Easily opened and closed for service cuts . . .

Busy Streets *need* VITRIFIED BRICK PAVEMENT

WHERE heavy traffic flows, there you need brick. It keeps the lanes open year after year for less cost than any other pavement known.

And for busy roads, brick is the logical choice, for both new construction and resurfacing old slabs. Brick *resists weather,* arch-enemy of most pavements. The material is so tough and dense that nothing on wheels can damage it. Thus, more use at less cost.

Above: Looking down a 40-block stretch of Brick pavement on Richmond, Virginia's East Main Street, of which city Colonel R. Keith Compton is Director of Public Works; Mr. A. Mason Harris is Chief of the Bureau of Streets. *To Right:* Close-up of brick surface from Connecticut Ave., Experimental Road, Chevy Chase, Md., which was built over 17 years ago by the U. S. Bureau of Public Roads. In this test Brick has the lowest maintenance cost of all pavement types.

For additional information, Address National Paving Brick Manufacturers Association, 1245 National Press Building, Washington, D. C.

VITRIFIED

BRICK PAVEMENTS

FACE THE FUTURE « » PAVE WITH BRICK

NEWS AND ILLUSTRATIONS

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

HILLITE FLOODLIGHT PROJECTOR

Floodlight Projector for Outdoor Recreation

In the design of the Hillite No. 22 floodlight projector, the Hill-Standard Co., Anderson, Ind., has embodied features of both the enclosed and the open type projector. Efficiency has been brought to a high point, with proper diffusion and non-glaring characteristics.

The unit is composed of a cast iron one-piece bowl, with diffusion rings in the rear; a skirt of 20-gage Armco enameling stock, beaded and ribbed; a one-piece cast aluminum chimney, tapped for conduit connection; skirt clamps, screws and hinge-pin of solid brass, and a porcelain mogul lamp socket in the chimney. The bowl and skirt are porcelain enameled blue-white inside and grass-green outside, making them rust proof.

This model is furnished as an open type projector or with glass enclosure. It may also be had with individual wire screen protector attached to the outer edge of the skirt and with chromium polished reflector. It may be used with 1,000-, 1,500- or 2,000-watt lamps, and may be attached to a wall or to a wood or steel pole.

The Hillite projector is suitable for filling stations, auto parking lots, service stations, loading docks, railway stations, wharves, outdoor advertising, playgrounds, swimming pools, beaches, and tennis, volley-ball, miniature golf, and handball courts. It is attached to a pole by a neat, strong adjusting fixture, which is drilled and tapped for conduit, so that wires are protected and hidden within the pole.

A Flush Type Marker Light for Airports

For outlining airport runways and indicating by means of distinctive colors particular runways on which planes are to land or take-off, the flush type marker light has been developed by the Westinghouse Electric & Manufacturing Co., Edgewater Park, Cleveland, Ohio.

Because it is installed in the ground with the upper edge of the lens ring flush with the surface of the field, this unit offers no obstruction to the plane passing over it. The maximum projection above the field is only $\frac{3}{4}$-inch and the unit is equipped with a heavy crystal lens which safely carries the weight of a plane.

The units are available with lenses of several different colors, so that they may be used for controlling traffic on multi-runway airports. Green indicates the runway for taking-off, amber is used to indicate the taxiing lanes and to outline the center circle on a field, and clear lens units are used for boundary lights only.

The marker is solidly constructed of cast iron, hot galvanized inside and out. It is a watertight, non-ventilated unit and furnishes complete protection of the circuits. It is furnished for either multiple or series circuits, using lamp sizes up to

WESTINGHOUSE FLUSH TYPE MARKER LIGHT

1,000-lumen series or 200-watt multiple.

It is equipped with a permanently efficient chromium-plated reflector and is very effective even in thick weather.

Asphalt Surface Heaters and Patchers

Designed to burn the very much cheaper fuel oils which, when compared to the cost of kerosene, cut the fuel cost by more than half, and to make it suitable for extensive yardage work by using low-pressure fuel oil burners which do not clog or carbonize and require no preheating, the Hauck fuel-burning asphalt surface heater, made by the Hauck Manufacturing Co., 105 Eleventh Street, Brooklyn, N. Y., may be used for sheet, bitumen and other grades of asphalt pavement maintenance.

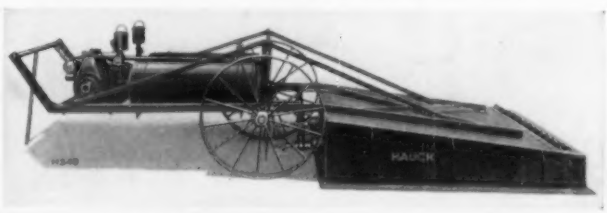
Two Hauck venturi low-pressure fuel-oil burners furnish the heat. The burners have established a reputation for easy lighting and regulating and trouble-free operation, and, by means of air at $1\frac{1}{2}$ pounds pressure, they atomize the oil, making preheating and preliminary warming unnecessary. The burners light instantly upon opening of the air blast gates and oil needle valves by means of lighted waste or burning paper. The size of the flame and degree of the heat are controlled at will by the operator by simply adjusting the air and oil valves. Either a short or a long, voluminous flame of 2,000 degrees Fahrenheit, more or less, can be produced as desired. Each burner averages 3 gallons of fuel oil per hour in normal operation.

Two 25-gallon capacity, heavy-gage, riveted, welded and galvanized tanks, equipped with large filling valves and funnels, are mounted on the chassis of the heater. The two tanks are interconnected so that one can be filled while the other supplies oil to the burners.

The chassis is of $2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{3}{8}$-inch angle iron. A 0.7-horsepower gasoline engine drives the rotary blower and both are mounted on a common bed plate bolted to the chassis. The axle is of 1 9/16-inch diameter heavy steel. The roller-bearing steel wheels are 36 inches in diameter with 3-inch face. The hood, which measures 6 feet long and 4 feet wide, is made of 3/16-inch steel plate, electrically welded throughout, reinforced and ribbed with heavy angle-iron.

Bacon Heads Fairbanks-Morse Pump Division

Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Ill., has announced the appointment of R. H. Bacon, former Advertising Manager for the company, as Manager of the Pump Sales Division with headquarters in Chicago. Mr. Bacon has been associated with the company since 1925, when he took charge of publicity for the Diesel Engine Division. Shortly thereafter he was placed in charge of general publicity and, since 1929, has been Manager of the Advertising and Publicity Department.



THE HAUCK FUEL-OIL-BURNING ASPHALT SURFACE HEATER

THE TRIPLEX—there is no equal

The Triplex performs as no other mower can—has a capacity for work that takes several power mowers to equal. Yet, this machine is as easily handled on difficult cutting jobs, as a small capacity mower. The Triplex cuts right to the edge of walls and walks. It whirls around a tree like a hand mower—and in a tight corner can turn around in its own length, or back up as fast as it goes forward. Rubber-tired wheels can be supplied to enable the Triplex to travel on the highway from one job to another. Cutting costs are lowered by this 35-acre-per-day machine.

Some of the prominent Park Departments using The Triplex:
Park Department, New Brunswick, N. J.; Park Department, Buffalo, N. Y.; Central Park, New York, N. Y.; Park Department, Columbus, Ohio; Park Department, Toledo, Ohio.

The Triplex

The Bulldog

Where the cutting job is big, and unobstructed by trees and bushes—such as a golf course fairway—the Ideal Bulldog cannot be equaled. Its low wheels and close coupled frame allow the seven-blade cutting reel to get right to the bottom of every hollow, and to cut smoothly over the top of every hillock. The Bulldog frame *pushes* the cutting units ahead and into the work, they cannot skip over heavy grass, cannot sway from side to side when cutting on a hillside. The unique Bulldog design gives it performance advantages over every other gang mower.

Wheel type—20, 25-inch cut

Roller type—22, 30-inch cut

New Power Mowers

The new Ideal Power Mowers have increased power, increased speed, increased handling ease. Their flexibility of control is surprising. Their deep-chested motor carries even the heavier, roller type up steep hills without trouble. Aluminum parts give lightness to wheel type. New lubrication system means longer life. New cooling system prevents overheating on even the hottest days. Two sizes of wheel type—20, and 25-inch cut. Two sizes of roller type—22, and 30-inch cut.

The Bulldog

IDEAL POWER LAWN MOWER CO.
400 Kalamazoo St., Lansing, Mich.

FACTORY BRANCHES

413 W. Chicago Ave.
Chicago, Ill.

237 Lafayette St.
New York, N. Y.

161 Vester St.
Ferndale (Detroit), Mich.

273 Boylston St.
Brookline, Mass.

Dealers in all principal cities

Canadian Distributor: Aikenhead Hdw. Ltd., 17 Temperance St., Toronto, Ont.

IDEAL
GRASS CUTTING EQUIPMENT

HAMMEL FABRICATED LIGHTING POLE

Fabricated Poles for Street Lighting

As a general rule, steel poles cannot be installed except in or on a concrete foundation. The design of the Hammel pole, made by the Pittsburgh Crucible Steel Co., Pole Division, Pittsburgh, Pa., permits setting it in earth without additional cost of concrete foundations, sleeves or footings. Its form is such that the pressure of tamped earth will sustain the pole in proper position and constitutes good erection.

This pole does not offer conditions for fungus growth and deterioration at the ground line, it is not easily damaged by shocks, it is not constructed of materials of varying elasticity, and there is no chance of spalling or disintegration in service. The pole is of such form that it can be removed easily and cheaply as the occasion may demand, being made in lengths suitable for easy handling and shipping in ordinary freight cars. Because of the openings, they are conveniently handled with grappling hooks and slings. The poles pack readily and nesting is possible.

For use as street-lighting poles, an ornamental base is provided which is in keeping with the general design and gives a pleasing finish to the structure as a whole. The base is constructed in two parts. These fit snugly one into the other and are set on a concrete foundation secured by three central bolts made from high-grade bar steel stock. Removal of the door and raising of the cap gives immediate access to the foundation bolts. This method of securing to the foundation enables speedy and rigid erection. Street-lighting hardware has been developed for use with these poles to permit the use of cross-arms and other accessories.

The Hammel pole lends itself to combination with wood and other suitable materials, giving a composite structure which combines the elements of maximum strength in bending, torsion and columnar action. One advantage of the metal lower sections in erections of this type is the protection of the pole against destruction by fire or attack of vermin. This composite pole, having its upper section of wood of definitely established longitudinal dimension, together with a metal lower section, gives great protection against destruction by lightning. With a definite gap between the steel section and the conductors, the lightning will readily jump from the conductors across the wood and seek ground through the steel without burning the conductors or shattering the wood.

The poles are well suited for use on distribution and transmission lines, to support trolley-span wires, as telephone and telegraph pole installations, and for lighting standards, airport lighting and aerial towers.

The design of the pole embodies the principle of the cubic structure, developing maximum strength and flexibility with minimum weight. It is a one-piece cylindrical steel structure, free from rivets, bolts, joints, splices and other local weaknesses. All poles are designed to withstand the calculated stresses produced by their own weight and the weight of the conductors, taking into account the loading and climatic conditions for the territory in which they are to be erected, allowing adequate factors of safety. Corrosion-proof metallic protection paints and special corrosion-resisting treatments are applied, according to service conditions.

New Yeomans Representatives

The Yeomans Brothers Co., 1433 Dayton Street, Chicago, Ill., has announced the appointment of the following three new representatives: Andriot Davidson Co., 1307 Starks Building, 4th and Walnut Streets, Louisville, Ky.; Johns Equipment Co., First National Bank Building, Fort Wayne, Ind.; and H. A. Grossmann Co., 3221 Olive Street, St. Louis, Mo.

Tank Company Moves Dallas Office

The Dallas office of the Chicago Bridge & Iron Works, Chicago, Ill., moved to the Burt Building, Dallas, Texas, on May 1. This office, which is in charge of H. B. Murphey, handles all sales endeavors for the company in the Southwest and erection work for the entire South.

Boring Machine for Installing Small Diameter Pipe

Soft spots in the roadbeds of highways and railroads have long been sources of trouble and expense to maintenance men. Increasingly heavier rolling equipment on railroads, and high speeds, have aggravated such conditions and emphasized the need for a quick, economical method of installing pipes which would not interfere with the use of the traveled surface. To meet this need, the Armco Culvert Manufacturers Association, Middletown, Ohio, has developed a boring machine for installing corrugated iron drain pipe in 8-, 12- and 18-inch diameters.

The Armco boring machine serves the double function of excavating and removing the material replaced by the pipe. The entire machine is mounted on a track, upon which it is moved forward as jacking progresses. The jacking itself is done by hand at the rear of the machine by means of an especially designed jack operating on a rack between the rails of the track on which the machine moves. Power for excavating is provided by a gasoline motor and is transmitted to the borer by a shaft extending through the pipe. A spiral conveyor is built around this shaft, which, as it revolves, removes the spoil through the pipe upon a smooth metal trough placed in the invert. When a section of pipe has been placed, the machine is returned to the starting point, another section of pipe and a corresponding length of lining and conveyor attached, and the process repeated. This is repeated until the required amount of pipe is placed.

The Armco boring machine, which has already proved its value in actual service, avoids many of the objections to the installation of drainage by the open trench method. It eliminates a long construction period, with its attendant detours, slow orders and interrupted train schedules. Traffic is not interfered with while construction is in progress, nor is there an unstable roadbed or a marred pavement to be maintained for a long period after the job has been completed.

Graver Appoints Eastern Representative

The Graver Tank & Manufacturing Corporation, East Chicago, Ind., manufacturers of water-treating equipment, tanks and special plate construction, has appointed W. B. Connor Co., Chrysler Building, New York, as its eastern representative.

ARMCO BORING MACHINE INSTALLING 18-INCH CORRUGATED IRON PIPE WITHOUT HINDRANCE TO TRAFFIC

REVOLUTIONIZING TRUCK VALUES

ANNOUNCING THE NEW

1½ TON REO SPEED WAGON

By actual comparison the new SPEED WAGONS surpass all commercial vehicles in the lowest price 1½-ton field!

Equipped with heavy, powerful truck type 4 or 6 cylinder engines!—each having *more* bearings and *larger* bearings than any competitive engine! And Reo's maximum piston displacements give abundant power!

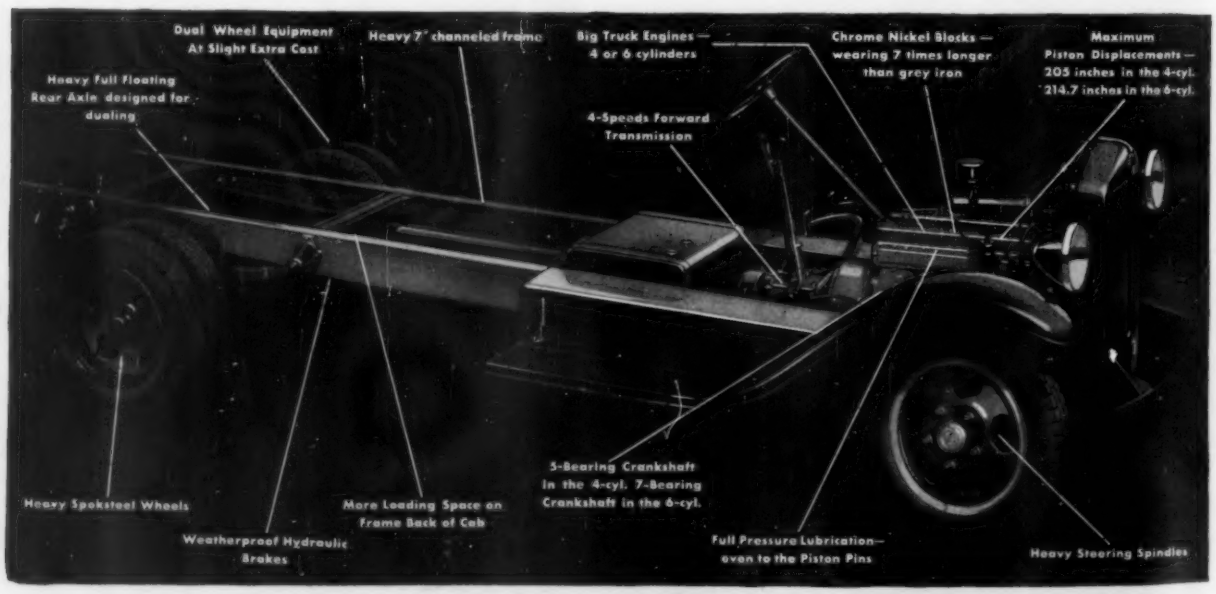
The REO cylinder blocks are cast of chrome nickel iron, actually 7 *times longer wearing* than the usual grey iron! Pressure lubrication forces oil constantly to all vital engine parts, *even to the piston pins!* Frames in the new SPEED WAGONS are 7″ deep! The brakes are *hydraulic*, fully enclosed, weatherproof, safe!

Compare specifications with REO'S. *Drive* the new *SPEED WAGONS.* Load them with your own loads—test them on your own particular haulage routes. Then you will realize that these remarkable new trucks truly uphold the finest of Reo traditions—*quality throughout.*

$625

Four-Cylinder $625, Six-Cylinder $725
Chassis f. o. b. Lansing, Michigan
DUAL WHEELS EXTRA

REO MOTOR CAR COMPANY, LANSING · TORONTO


Dual Wheel Equipment At Slight Extra Cost
Heavy 7" channeled frame
Big Truck Engines — 4 or 6 cylinders
Chrome Nickel Blocks — wearing 7 times longer than grey iron
Maximum Piston Displacements — 205 inches in the 4-cyl. 214.7 inches in the 6-cyl.
Heavy Full Floating Rear Axle designed for dualing
4-Speeds Forward Transmission
5-Bearing Crankshaft in the 4-cyl. 7-Bearing Crankshaft in the 6-cyl.
Heavy Spoksteel Wheels
More Loading Space on Frame Back of Cab
Weatherproof Hydraulic Brakes
Full Pressure Lubrication—even to the Piston Pins
Heavy Steering Spindles

During June we hope you will remember to mention THE AMERICAN CITY

A Bituminous Distributor with Separate Engine-driven Pump

A separate engine-driven pump type of distributor for the application of all grades of oil, tar and asphalt used for bituminous road construction and maintenance, has been brought out by E. D. Etnyre & Co., Inc., 85 Jefferson Street, Oregon, Ill., in the Etnyre Model F distributor. One of the important features of this distributor is the heater in which the hot gases from the burners are circulated through flues, three times the length of the tank, before exhausting at the front end. The flames from the burners do not come in contact with the tank. Even though there is no spring type relief valve in the distributing system, it is impossible to place the operating levers so as to cause injury from excessive pressure.

All the material in the lines is circulated and returned to the tank by running the pump, the distributing and circulating systems being enclosed with a metal housing to eliminate loss of heat. Heat is applied to the entire distributing and circulating system by a single burner and the use of a radiator. The entire distributing and circulating system drains by gravity, when the tank is full or empty, by shifting operating levers to the central position, and air can be forced through with the pump to expedite drainage.

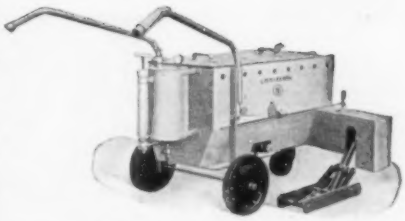
The light-weight spray bars are quickly and easily attached or detached by means of snap connections, without the use of tools. By using the spray bars singly or in various combinations of widths, from 4 to 20 feet of highway can be sprayed at one time.

By the use of a tachometer with this distributor, the exact amount of material going through the spray nozzle at any given speed of the truck is indicated. This Stewart-Warner instrument has a special dial which registers from 0 to 1,000. It is driven from the transmission or a sprocket attached to the front wheel of the truck and is geared so that each mark on the dial indicates a speed of 1/10-mile per hour, so that the 100-mark on the dial is equivalent to a speed of 1 mile per hour. A speed-regulating chart is carried in a bracket located on the dash where it can be easily read by the driver.

Auxiliary equipment required for special work and which may be ordered separately for use with the Model F distributor, includes the tachometer, spray bars in 5-, 6-, 7-, 8-, 9- and 10-foot sections, nozzles with various widths of slot from 3/32 to 7/32-inch, a shifting spray bar attachment which enables the operator to control the position of the spray bars, and a basket-type manhole strainer made of 18-gage steel with $\frac{1}{8}$-inch round perforations. A tank gage for registering the amount of material in the tank, a hand spraying attachment for spraying curves, entrances to driveways, intersections, etc., flexible metallic tubing for conveying oil, tar and asphalt at all temperatures and pressures, and a Tycos mercury-actuated thermometer with a 5-inch open round dial registering from zero to 500 degrees Fahrenheit, may also be ordered as special equipment. Tanks of oval cross-section can be furnished instead of the circular cross-section tanks in sizes of 900 to 1,200 gallons, inclusive. A two-speed gear reduction in which the high gear ratio is the same as in the single gear type, can be furnished with a low gear which makes it adaptable for light application. The increased power from this reduced ratio also permits of starting the pump with less heating in the morning, and it will pump material at lower temperatures.

MacNeille Now with Dayton-Dowd Company

M. B. MacNeille has joined the sales organization of the Dayton-Dowd Co., Quincy, Ill., and will act as Western Sales Manager for Dayton-Dowd centrifugal pumps, with headquarters in San Francisco. Mr. MacNeille was connected with the Pump Division of Fairbanks, Morse & Co., for 19 years in the capacities of designing engineer on centrifugal pumps, Chief Engineer of the Hydraulic Division and, for the past six years, Manager of the Pump Division.



LITTLEFORD COMBINATION JOINT FILLER AND LINE MARKER

A Combination Joint Filler and Traffic Line Marker

The newly improved combination joint filler and line marker made by Littleford Bros., Cincinnati, Ohio, keeps the asphalt intended for use in filling joints hot and applies it direct to the joint, with no chance for it to cool. Asphalt is drawn from a heating kettle into the 20-gallon tank with burners, one directly under the tank and another under the outlet valve. These burners keep the melted asphalt at the proper temperature, and no attempt should be made to melt a batch of material in the joint filler tank. When material is applied to the joint or crack, it is hot and therefore penetrates to the bottom of the joint and seals it.

Both gasoline burners are protected by windshields and will operate satisfactorily in any kind of weather. Asphalt is always at the proper temperature and ready for instant application.

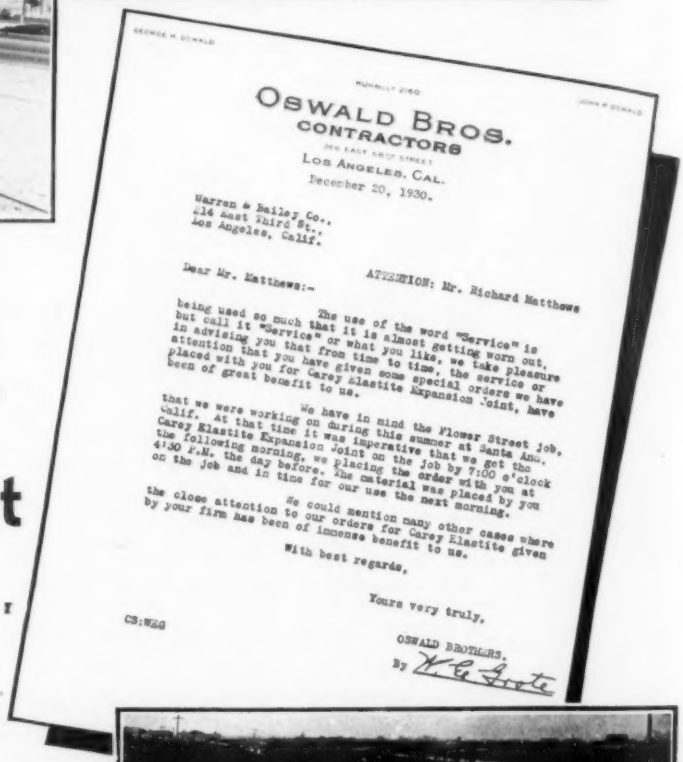
The marking attachment for use with this joint filler can be easily and quickly fitted to the machine, which can then fill the joint and mark an asphaltic center line from 2 to 8 inches wide. The joint filler can also be fitted with an automatic hopper that spreads sand and chips over the freshly filled joint.

Morris Machine Works Moved Chicago Office

The Morris Machine Works, Baldwinsville, N. Y., moved its Chicago office to Evening Post Building, 211 West Wacker Drive, on May 1.

A FLEET OF FIFTEEN 800-GALLON MODEL F ETNYRE DISTRIBUTORS MOUNTED ON AUTOCAR CHASSIS, DELIVERED TO THE U.S.S.R. A FEW MONTHS AGO

Photographs show California boulevards paved by Oswald Brothers, Los Angeles, California, using Carey Elastite Expansion Joint.



OSWALD BROS.
CONTRACTORS
LOS ANGELES, CAL.

December 20, 1930.

Warren & Bailey Co.,
214 East Third St.,
Los Angeles, Calif.

ATTENTION: Mr. Richard Matthews

Dear Mr. Matthews:-

The use of the word "Service" is being used so much that it is almost getting worn out, but call it "Service" or what you like, we take pleasure in advising you that from time to time, the service or attention that you have given some special orders we have placed with you for Carey Elastite Expansion Joint, have been of great benefit to us.

We have in mind the Flower Street job, that we were working on during this summer at Santa Ana, Calif. At that time it was imperative that we get the Carey Elastite Expansion Joint on the job by 7:00 o'clock the following morning, we placing the order with you at 4:30 P.M. the day before. The material was placed by you on the job and in time for our use the next morning.

We could mention many other cases where the close attention to our orders for Carey Elastite given by your firm has been of immense benefit to us.

With best regards,

Yours very truly,

CS:WEG

OSWALD BROTHERS,
By

Carey Elastite EXPANSION JOINT

Quick Shipment Cuts Costs . . .

The service that Oswald Bros. wrote about is made possible by a nation-wide organization of Carey distributors. Ample stocks of Carey Elastite Joint are carried in all large cities, and orders for special as well as standard sizes can be filled promptly.

For almost 20 years "Carey Elastite" has justified the confidence which road builders have placed in it. The correctness of its design—an asphalt compound between strong felt walls—has been definitely proven. Used in concrete roads thruout the entire country, Carey Elastite Joint is depended upon when both quality and delivery must be beyond question.

THE PHILIP CAREY COMPANY × Lockland, Cincinnati, Ohio

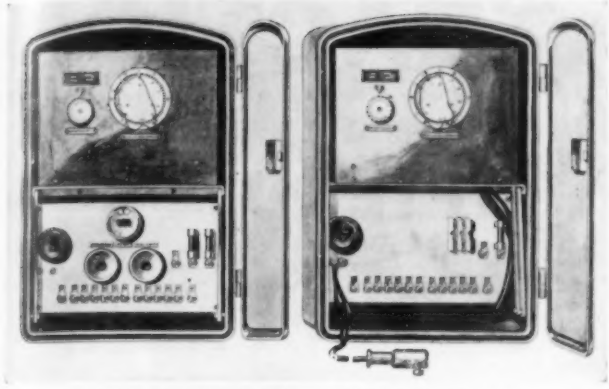
Branches in Principal Cities

BUILT-UP ROOFS
ASPHALT PRODUCTS
ELASTITE EXPANSION JOINT
WATERPROOFINGS
ROOF PAINTS

Carey PRODUCTS EST. 1873

HEAT INSULATIONS
ASBESTOS MATERIALS
CAREYSTONE CORRUGATED SIDING
ASFALTSLATE SHINGLES
BUILDING PAPERS

319



NOVALUX SUPERVISORY AND INTERSECTION TYPE TRAFFIC-CONTROL BOXES

A New Traffic-Control Timer

A new type of traffic-control timer which can be used at isolated intersections, for limited progressive traffic movement, non-interconnected, and for flexible progressive traffic movement in an interconnected system, has been introduced by the General Electric Co., Schenectady, N. Y.

The various features of this timer include complete color-sequence flexibility, local and remote total cycle adjustment, flexible push-button manual control which prevents false indication, and triple reset. A complete control system can be planned years ahead and the control installed a unit at a time, with the control modified and adapted as intersections are added.

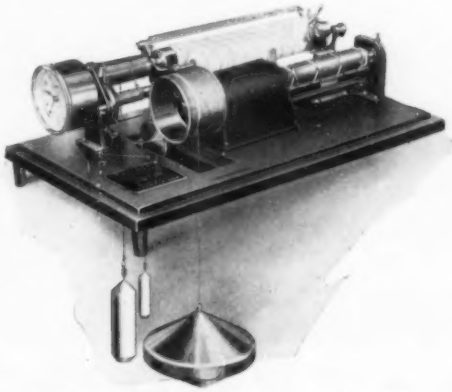
Three-street and special intersection controls may be provided by a slight factory modification of the standard control. The unit is housed in a cast-iron weatherproof cabinet adapted to pole or pedestal mounting. It has provision for flashing amber, red and amber, and flashing red, as well as steady red and manual control. The timber is jack-mounted and fastened on a shelf, so that it can be lowered out of the box and easily inspected or replaced without the use of tools.

Recording the Stage of Impounded and Flowing Waters

Of roll chart construction, the design of the Au Fuzee screw recorder for recording water-level data, made by Julien P. Friez & Sons, Inc., Baltimore, Md., provides operation for 60 days without attention. By limiting the operation to 60 days, a simple construction has been attained with but two rolls and a minimum of moving parts.

The distinctive feature of the recorder and that from which it received its name, is the slightly conical, spirally grooved pulley at the left and back of the instrument, known in fine clock-making as a fuzee, the function of which is to drive the paper at a constant lineal speed. The fuzee is so shaped that its small diameter is equivalent to the diameter of the take-up roll, to which it is directly attached, when there is no paper on the roll, and the large diameter is the equivalent of the roll with 60 days accumulation of paper. At the start, with one wrap of paper on the take-up roll, the clock-weight cable is placed at the small end of the fuzee. As the weight falls, the fuzee rotates, the take-up roll winds up the paper, and the cable travels in the spiral grooves from the small to the large end of the fuzee, reaching the end in 60 days. At any moment during the 60 days, the effective diameter of the fuzee at the point where the cable is in contact is equivalent to the diameter of the paper roll at that moment. The effect is the same as though the cable rested directly on the paper of the take-up roll and, as the cable is unwound by the clock at a constant speed, the paper must travel at a constant lineal speed, also. With this construction, only two rolls are necessary, and the replacement of the paper is accomplished quickly without inconvenience, even under most severe weather conditions.

The illustration shows the recorder with cover removed.



WATER STAGE RECORDER, FUZEE PAPER DRIVE

A Road Maintainer That Scarifies, Grades and Rakes in One Operation

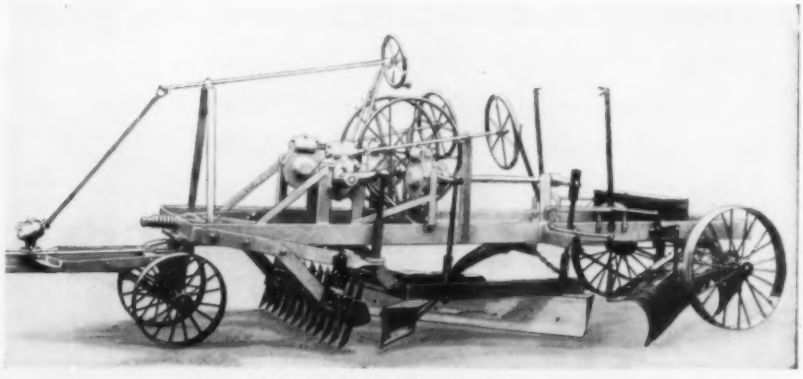
A road maintenance machine in which the scarifier in front loosens the hard-packed surface, the blades, following, shape the loosened material, and the rake at the rear not only distributes the surplus dirt but rakes out the stones, has been developed by the York Modern Corporation, Unadilla, N. Y., in the York Super Workman.

The scarifier-head of this machine is a one-piece steel casting, weighing 650 pounds, to which are attached 12 alloy steel scarifier teeth, each tooth held in place by a single bolt. The working width of the scarifier is 6 feet. The maintenance unit consists of two opposing blades which stabilize the unit and eliminate side draft. The blades have reversible cutting edges 12 inches wide, one blade being 29 inches and the other 8 feet long. The short blade may be lowered to cut down high crowns, and when the machine is used for grading, this blade may be raised.

The front section of the rake has 40 teeth spaced to remove larger stones, while the rear section has 32 teeth spaced closer to remove smaller stones. The rakes are of flexible all-steel construction, insuring strength without excessive weight. They may be lowered for use on maintenance work and raised out of the way when the machine is used for grading.

The operator's spring platform gives a clear view of all working units, and all operating wheels and levers are within easy reach. The scarifier may be tilted to meet changing road conditions. The scarifier and blades are operated through machine-cut gears running in oil. The machine has positive lubrication to all bearings, a blade unit shock spring, and a machine-cut enclosed steering gear.

The Super Workman destroys all ruts, holes and washboards instead of merely covering them up. It produces a road which is not only smooth on top, but smooth several inches under the surface. This and the fact that all oversize stones are removed, makes a road that wears smooth.



THE YORK SUPER WORKMAN

POWER AND TRACTION

BUILT THIS FIELD!

CATERPILLAR
REG. U. S. PAT. OFF.
TRACTOR

"CATERPILLARS" built it! Plenty of power and plenty of traction — tracks to ripple over the soft soil of the fill — power to handle big yardage. "Caterpillar" track-type Tractors have built many famous airports — including this one at Newark, New Jersey. And a "Caterpillar" is the best choice for later maintenance working — nimble enough to jockey the big birds into position, powerful enough to dig a drain or push snow aside.

Prices—f. o. b. Peoria, Illinois

TEN	$1100	TWENTY	$1900
FIFTEEN	$1450	THIRTY	$2375
	SIXTY	$4175	

Caterpillar Tractor Co.
PEORIA, ILLINOIS, U. S. A.

TRACK-TYPE TRACTORS COMBINES ROAD MACHINERY

(There's a "Caterpillar" Dealer Near You)

An Approved Half-Hour Oxygen Breathing Apparatus

The McCaa one-half hour self-contained oxygen breathing apparatus, made by the Mine Safety Appliances Co., Braddock, Thomas & Meade Streets, Pittsburgh, Pa., has been officially approved by the United States Bureau of Mines for safety, practicability and efficiency in general service. This apparatus furnishes respiratory protection in atmospheres which are deficient in oxygen and have high concentrations of gases.

McCaa apparatus of the two-hour type is widely used by the mining industry in rescue and recovery operations following mine explosions and during mine fires. The half-hour apparatus is now standard equipment for many municipal fire departments and is also widely used industrially where respiratory protection is required for short periods.

The McCaa two-hour apparatus, the half-hour apparatus, the Burrell All-Service gas mask and the M-S-A combination hose mask round out a complete set of respiratory equipment, all of which have been officially approved by the U. S. Bureau of Mines.

MC CAA HALF-HOUR OXYGEN BREATHING APPARATUS

Traffic Signal Markers

A traffic marker of the button or mushroom type, oblong in shape, and placed in the street or roadway directly in the line of the drivers' vision where it cannot be overlooked, has been developed by the Service Foundry Co., 331 North Mosley Street, Wichita, Kans.

The Service traffic signal is 22 inches long and 15 inches wide and graduated from the edge to the highest point in the center of the marker, 2½ inches above the pavement. The base of the marker is made from first-quality black semi-steel, and the center, 13 inches long, 6 inches wide and 1 inch in depth, is made of aluminum and acts as a reflector. Cars running over the marker keep this aluminum center and the monel letters, which are 4 inches high, polished. The rustless white monel metal, which is 75 per cent nickel, is harder than steel and will not tarnish or corrode, but remains permanently bright.

SERVICE TRAFFIC MARKER

Four lugs at different points on the markers keep them from turning, making a permanent installation that will not break or wear out.

In installing the signal, it is placed in position, and the hole for the center bolts and lugs marked and drilled to the correct depth, the openings filled, and ½-inch of cement spread under the signal. The bolt head is then set down 3½ inches and the signal tamped down solid. As soon as the cement has set, the nut is screwed on lightly and then tightened, holding the signal in place.

New Body Types for Light-Weight Trucks

Several new body types, especially adapted to the needs of municipalities, have just been introduced by the Ford Motor Co., Dearborn, Mich. They include garbage dump-trucks, police patrols, ambulance and service car, all mounted on the Model AA 1½-ton truck chassis.

The garbage truck, built for either 2 or 3 cubic yards capacity, is made of steel reinforced and welded at all joints. The load is dumped by means of a heavy hydraulic hoist controlled by a gear-shift lever in the driver's cab.

Two police patrols, a standard and a de luxe model, are among the new Fords. The standard patrol has seats that run the length of the body and that may be folded down flat, meeting in the center and forming a bed to accommodate two persons. A heavy roller curtain may be pulled down to close the opening at the rear. The de luxe patrol has provision for carrying firearms in the roof of the driver's compartment, and includes a stretcher and spaces for blankets, medicines, bandages, etc.

The ambulance has a large door in the rear and a door on either side of the body behind the driver's compartment. A large window on each side is made of a single piece of Triplex shatterproof glass. Equipment includes cot, auxiliary seat, fan, heater and medicine cabinet.

Cities servicing their own fleets will be interested in the Ford service car, on which any type of block and tackle or hoisting equipment may be installed.

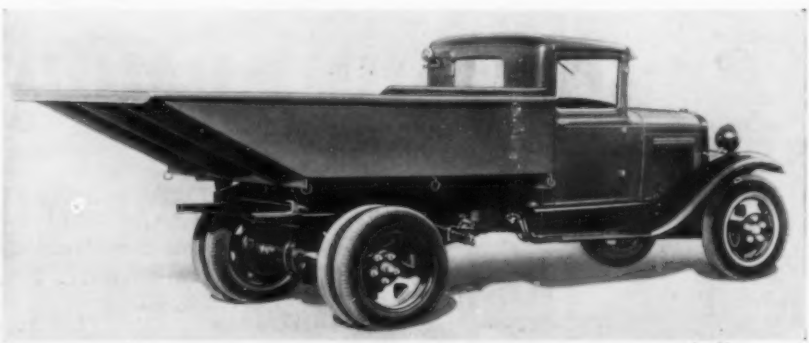
Wood to Consolidate Westinghouse Lighting Activities

All lighting activities of the Westinghouse Electric and Manufacturing Co., which are centered in the Cleveland Works, have been coordinated in one division under the management of L. A. S. Wood. This grouping was arranged to more effectively promote the sale of Westinghouse lighting equipment and completes plans made when the lighting activities were established at Cleveland.

The lighting section will be organized under two principal groups. In the street lighting group will be street and highway lighting, tunnel, bridge, and park lighting. Commercial lighting will include commercial and industrial lighting, floodlighting, athletic field lighting, industrial yard and railway lighting, dock lighting, airport and exposition lighting.

Fisk Opens Consulting Practice

George F. Fisk, formerly Commissioner of Public Works of Buffalo, N. Y., has announced the opening of offices at 557 Ellicott Square, Buffalo, for the practice of consulting engineering with special reference to paving and municipal problems.



FORD MODEL AA TRUCK EQUIPPED WITH GARBAGE BODY

THE IDEAL CABLE

for low-cost underground circuits

for Airports

A large footage of cable is needed for the underground circuits which supply power to airport beacons, border lights, markers and floodlights. It is essential that the cable chosen be thoroughly protected against damage and moisture and be economical in first cost.

Hazard Armortite cable meets these specifications perfectly. The armoring is a hard vulcanized tape which provides ample protection against abrasion and other mechanical damage. Its performance in service has demonstrated its adequacy for airport use.

In addition, its low cost, light weight and flexibility make it extremely economical to lay and thus permit a better lighting installation for a given expenditure than more expensive forms of cable.

Investigate by writing our nearest office for complete information.

HAZARD ARMORTITE CABLE

HAZARD INSULATED WIRE WORKS

Division of The Okonite Company

WORKS: WILKES-BARRE, PA.

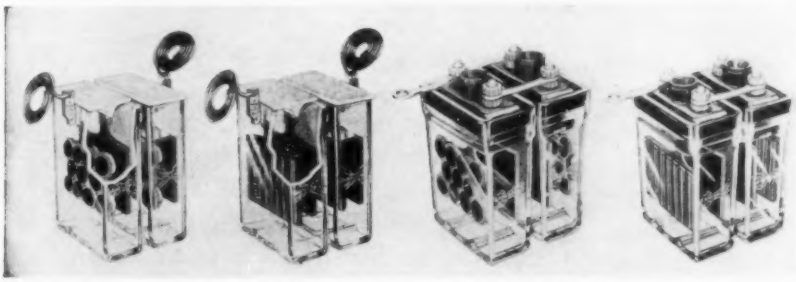
New York Chicago Pittsburgh St. Louis Boston
Atlanta Philadelphia San Francisco Los Angeles Seattle Dallas

New Line of Fire-Alarm and Police-Signal Batteries

Three new and one improved cell of battery, designed specially for fire-alarm and police-signal systems, have just been announced by the Gamewell Co., Newton, Mass. The first two, known as FIP and ICO, are open-type cells and are recommended for use on large systems where there is a competent man available at all times to care for the battery. The others, Types BTIS and ICS, are of the sealed-in style and are recommended for the smaller systems where the care of the entire system falls upon the shoulders of one man.

The FIP and BTIS types are intended for use with the present type of system with duplicate sets of battery, cycle charged. On the other hand, the ICO and ICS types have been designed particularly for the floating battery system which is now being offered by the Gamewell Co., where a battery of slightly larger capacity is desirable.

The Gamewell Company has issued a new instruction card covering the care of batteries for fire-alarm and police-signaling systems. The card is prepared with a varnished face and an eyelet at the top, suitable for use in battery rooms, and is available on request to those interested.



THE NEW LINE OF GAMEWELL FIRE AND POLICE ALARM BATTERIES
From left to right, Types FIP, ICO, BTIS and ICS

Testing Laboratory Celebrates 50 Years of Service

Fifty years ago the Pittsburgh Testing Laboratory, Pittsburgh, Pa., was established by Alfred E. Hunt and George H. Clapp as chemists and metallurgical engineers under the name of Hunt and Clapp—Pittsburgh Testing Laboratory. The field of activities of the Laboratory was gradually widened, both as to the kind of work undertaken and as to the territory covered, until today it is one of the outstanding institutions of its kind in the world, with branch offices and laboratories in many important centers of the United States and associates in various foreign countries.

In addition to chemical and physical tests and investigations, this company performs engineering inspection of all kinds. Inspection service with regard to steel buildings and bridges includes mill inspection, embracing checks for surface, section and gage and personal supervision of tests; shop inspection during fabrication covering laying out, punching, assembling, reaming, riveting, checking of field connections, painting and weighing where required; and field inspection during erection. On concrete buildings and bridges the inspection service includes testing of cement, aggregates and reinforcement, supervision of construction and examination of failures.

Tests of stone, gravel, slag, sand, cement, oil, asphalt, binder, paving brick and wood block roads and pavements are made. Portable laboratories are employed for the expert supervision of asphalt mixing plants, concrete mixing plants, penetration treatments and the design of mixtures.

A well-illustrated 32-page brochure commemorating the Fiftieth Anniversary of the Pittsburgh Testing Laboratory and describing the facilities and service of this company in detail has been issued. Copies will be mailed on request to contractors, engineers and municipal officials interested in this service.

Painting Traffic Lines with Gasoline

When mixed 5 gallons with 8 gallons of gasoline, Hoosier Street Marking White, made by the Hoosier Paint Works, Fort Wayne, Ind., makes an economical, long-wearing paint for use in marking traffic lanes, parking spaces and pedestrian crossings.

This paint is put up in easily sealed 5-gallon cans, so that there is no waste due to evaporation or hardening of the unused paint. It is a permanent white which remains clearly visible for several months under traffic and is mixed fresh for the job as fast as it can be stirred for use. Six minutes after application, the street or road is ready for traffic.

This traffic paint is also made in yellow for traffic-zone painting. Other municipal paints made by this company include green for police report boxes, red for fire-alarm boxes, yellow for fire hydrants, green for lamp posts and park benches, and yellow for airport buildings.

A Catalog of Tractor-operated Equipment

The flexibility of the McCormick-Deering Industrial tractor, made by the International Harvester Co. of America, Inc., 606 South Michigan Avenue, Chicago, Ill., and its ability to deliver ample power not only for drawbar and belt work, but also through the power take-off, as well as its rugged design, have made possible the development of a wide variety of special equipment operated by the tractor.

Various types of this equipment, designed by over one hundred manufacturers for operation by McCormick-Deering power, are described and illustrated in the new catalog issued by the International Harvester Co. The book is divided into sections A to S, inclusive, under headings such as "Air Compressors," "Cabs, Bumpers and Trucks," "Ditchers," etc. An ingenious thumb index makes it possible to easily find the description of the type of equipment desired.

Copies of this book will be sent free to municipal officials writing to the International Harvester Co. of America, Inc., 606 South Michigan Avenue, Chicago, Ill., and mentioning THE AMERICAN CITY.

Stuart Joins Industrial Chemical Sales Co.

Fred E. Stuart, who has been active in water softening and allied sanitary fields in the state of Florida for the last few years, has resigned his position with the city of Daytona Beach, Fla., to represent the Industrial Chemical Sales Co., Inc., 230 Park Ave., New York, in the sale of their Nuchar activated carbon for water purification.

Such rapid advancement has been made by the use of activated carbon in the field of water purification for the elimination of tastes and odors, that this company has placed trained men in the field for the benefit of water-works men who have problems in connection with water purification which they desire to solve.

Fuller and Everett Announce Partnership

Weston E. Fuller and Chester M. Everett have announced the formation of a partnership under the name of Fuller & Everett, with offices at 25 West 43rd Street, New York, to take over the business of Hazen & Everett, which will be carried on without change in policy.

Mr. Fuller was a partner in the firm of Hazen & Whipple from 1908 to 1915, and in the firm of Hazen, Whipple & Fuller from 1915 to 1922. Mr. Everett has been a partner in the firm of Hazen & Whipple and its successors since 1911, and in the firm of Hazen & Everett since 1929. LeRoy N. Babbitt, partner in Hazen & Everett, retired from practice on May 1, 1931.

Connors Made a Vice-President of Truscon

The Truscon Steel Co., Youngstown, Ohio, has announced the appointment of Garrett Connors as Vice-President and Director of Purchases in recognition of his ability in his 24 years of service as an executive in the production division of Truscon.

THE UNSEEN

COURIERS

OF THE SPOKEN WORD

THE FAMILIAR TELEPHONE that stands upon your desk at the office or in your home is only a very small part of the great communication system that enables you to talk across the miles with such surprising ease.

Behind it are complicated exchanges, a carefully trained organization of more than four hundred thousand men and women and eighty million miles of wire. These are the forces that make efficient telephone service possible. These are the unseen couriers of the spoken word.

Tirelessly, day or night, without rest or sleep, the Bell System awaits but the lifting of the receiver to carry your voice to any one of thirty-two million other telephone users in this country and abroad, and on ships at sea. It is done so quickly and with so little trouble that few people stop to consider what goes on between the giving of the number and the completion of the call.

Some time every day—perhaps many times a day—you use some part of a telephone system that has taken fifty years and more than four thousand million dollars to build.

The simple words "long distance," which you speak so casually into your telephone, place millions of dollars of equipment at your disposal. Yet the cost of a call from New York to Chicago is only three dollars and but a fraction of that for lesser distances.

Equipment of comparable cost is also needed to connect your home with the thousands or hundreds of thousands of other telephones in your town or city. Yet the charge for local service is only a few cents a day.

In relation to service rendered, the cost of the telephone is one of the smallest items in the monthly business and family budget. Few things purchased are of such real, constant and increasing value.

★ *AMERICAN TELEPHONE AND TELEGRAPH COMPANY* ★

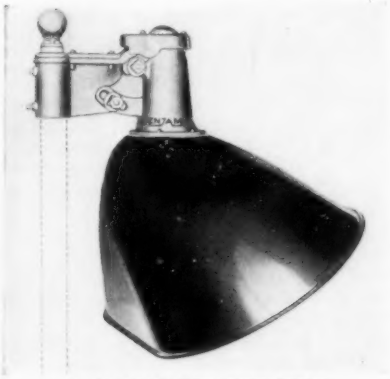
BELL SYSTEM

When you write for that catalog, kindly mention THE AMERICAN CITY

A New Wide Angle Floodlight

The new Benjamin Play Area Floodlight, No. 5752, made by the Benjamin Electric Manufacturing Co., Des Plaines, Ill., meets the four basic requirements of outdoor recreational lighting. It provides uniform and strong illumination on the ground and to the front and sides of the unit; it directs adequate light on vertical surfaces to be illuminated, such as players, apparatus and other objects; it directs part of the light into the upper areas, permitting players and spectators to follow an object such as a baseball or football in flight; and it minimizes annoying glare by shielding the lamp and prevents the glare from interfering with the vision of the players or spectators.

The new unit is an open-type wide-angle diffusing floodlight with a reflecting surface of special diffusing porcelain enamel in combination with an inner reflector of oxidized aluminum. It is ruggedly built for outdoor service and is weatherproof. The porcelain enameled



BENJAMIN OPEN TYPE WIDE ANGLE FLOODLIGHT

reflector never needs repainting or refinishing, and the inner reflector of aluminum oxide is non-corrosive.

The design of the hood and bracket assembly reduces time in wiring, assuring a neat, workmanlike job with all leads enclosed. The mounting bracket provides a wide range of adjustment of the floodlight both horizontally and vertically, to meet a variety of lighting conditions.

Light-Weight Fabric Traffic and Warning Signs

Brilliant yellow and striking red warning signs have been developed by Thomas E. Collins & Co., 1700 Olive Street, St. Louis, Mo., which are light in weight, strong and durable. These signs are made with rustless steel frames over which is stretched a tough cotton material known as Fabrikoid. On the brilliant yellow or red background are stenciled any necessary warning or caution wordings. These signs, which are easily handled and readily set up along highways, are not easily damaged and are low in price.

Twenty-nine state highway departments are using them as warning signs for the use of maintenance and patrol

COLLINS FABRIKOID WARNING SIGN

crews, and both the Western Union Telegraph Co. and the Bell System are using them in 71 of the largest cities and in 28 states, respectively.

Motor Pick-up Sweepers for Clean Streets

The results of long familiarity with the varied requirements of street cleaning are found in the many features of the Austin motor pick-up sweeper sold by the Austin-Western Road Machinery Co., 400 North Michigan Avenue, Chicago, Ill.

The four-wheel chassis of this machine has been designed to carry the various weights mounted on it to best advantage without any harmful distortion of the frame. The front axle carries a spring mounting for the motor. This spring mounting and the spring suspension of the broom and elevator absorb the vibrations from operation over uneven pavements, making for longer service.

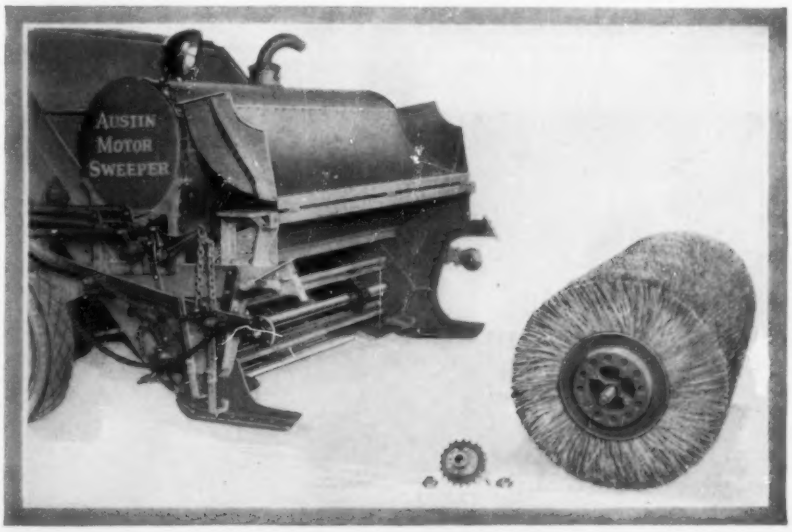
As most street dirt is near the curb, the steel wire gutter broom has the biggest job to do. The 42-inch oscillating gutter broom of the Austin sweeper provides a large cleaning surface and wide overlap with the rear pickup broom. The broom has two operating speeds so that the speed can be reduced, with a consequent lessening of wear on the bristles, and yet with reserve power and speed for heavy work. The oscillating feature permits ample deflection of the gutter broom in under the machine to prevent any possible damage from jamming curbs or striking other objects. There is also an automatic vertical adjustment, allowing the broom a rise and fall of 14 inches, insuring uniform sweeping pressure, on both level and uneven pavements.

The gutter broom is gear- and shaft-driven and set out far enough from the side of the machine to give plenty of clearance between the curb and the rear wheel. All working parts are enclosed and run in oil.

The beltless elevator on this machine handles dust, pebbles, sticks, tin cans, broken glass, leaves and dirt with equal efficiency. The elevator consists of a series of heavy rubber squeegees protected on both sides by steel strips and mounted on continuous steel roller chains. As these squeegees follow a circuit on an inclined plane between the upper and lower sprockets, they catch the dirt and refuse thrown by the pick-up broom at a point 3½ inches above the pavement, carry it up and drop it into the hopper, pass around the upper sprocket and return for another load. The elevating mechanism is protected from breakage by means of wooden break pins that will shear off at a strain slightly less than that required to bend one of the angles.

The flow of water through the dual sprinkling system can be controlled so that just the right amount is sprayed to dampen or lay the dust under all circumstances. The 200-gallon storage tank supplies just enough water for one hopperful of sweepings under average conditions.

Vegetable fiber, the type determined by the kinds and conditions of the pavements to be cleaned and the climatic conditions, is used in filling the pick-up brooms, two of which are furnished with each machine. This makes it unnecessary to take the machine out of service while one broom is being refilled.



AUSTIN MOTOR PICK-UP SWEEPER, SHOWING BROOM ASSEMBLY

Outdoor Lighting

A Section of *The American City*
Devoted to the Lighting of Streets, Highways, Airports, Athletic Fields and Parks, and the Floodlighting of Public Buildings

Greater Intensity, Minimum Glare, and Better Lighting Distribution for Main Business Street

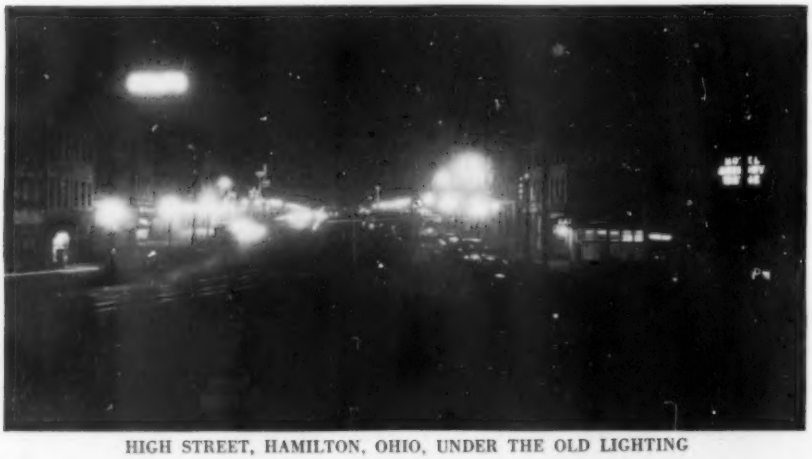
By JOHN E. NORTHWAY
Secretary-Manager, Chamber of Commerce, Hamilton, Ohio

HIGH STREET, the principal business thoroughfare of Hamilton, Ohio, has recently undergone a lighting transformation that represents a notable improvement in the street and is an advanced step toward making Hamilton one of the best-lighted cities of its size. Its 1930 population was 52,176, an increase of 31½ per cent over 1920.

The former single upright lighting units, using 300-watt lamps (about 5,280 lumens each) on 12-foot posts, have been superseded by tall steel standards carrying twin pendent luminaires, each of which is rated at 15,000 lumens, giving 30,000 lumens per pole. Furthermore, the new installation replaces the old separate poles for trolley-wire support, thus greatly improving the appearance of the street by day as well as by night.

The new standards are Elreco combination railway and lighting standards, made by the Electric Railway Equipment Co., of Cincinnati. Each consists of a tubular steel pole fitting into an ornamental cast iron two-piece base and inclosed by a hollow fluted steel shaft in two sections. An ornamental cast iron collar surrounds the top of the shaft and an ornamental head casting, weighing approximately 600 pounds, surmounts the entire arrangement and forms the double bracket from which the luminaires are suspended.

This initial installation extends from



HIGH STREET, HAMILTON, OHIO, UNDER THE OLD LIGHTING

AS SEEN WITH THE PRESENT ILLUMINATION

THE OLD AND THE NEW

LOOKING DOWN A ROW OF POLES
No back-guying is necessary to withstand the pull of the trolley span wires

the Great Miami River to Fourth Street. The poles are spaced about 100 feet part. With 30,000 lumens per pole this gives an average lumen output of approximately 600 per linear foot of street, which brings Hamilton well within the group of cities having business streets of high-intensity lighting which were shown in detail in the March issue of THE AMERICAN CITY (pages 182-185).

The luminaires are General Electric Form 32 Novalux units and are connected directly to a 20-ampere straight series circuit, no intervening current transformers being used.

High Mounting Minimizes Glare

One of the particularly outstanding features in regard to which the new installation excels the old has to do with the matter of glare. The old posts were short and the lighting sources were therefore at a level which brought them directly in the line of vision, producing glare, discomfort, and even danger. The new poles bring the light source to a height of 25 feet 6 inches above the sidewalk level, which, as shown by one of the illustrations herewith, is about twice as high as the former mounting. This removes the light sources from the ordinary line of vision, thus eliminating the difficulties referred to, while at the same time the light from the lamps is more evenly distributed. The pendent mounting instead of upright is also in accordance with the most modern ideas in street-lighting practice. The amount of light furnished by the new system is several times as great as that of the old, and the ratio of improvement is increased by the better application and distribution.

Steel poles of the proper diameter to meet the wire load caused by the trolley span wire were selected. The pole is set six feet below grade and the ornamental cast iron pole base is attached around it at the sidewalk. The base is made in two pieces and in case of actual breakage from traffic accidents either one or both parts can be replaced without it being necessary to remove the fluted steel casing or the head casting. In assembling the entire unit the fixtures are wired before being hoisted into place, with a sufficient length of wire to be dropped down the tubular pole and brought out in the space between the base and the pole where the connection is made to the underground circuit. The base has removable panels, making access to the wiring unusually easy.

Paid for by Municipal Electric Plant

The current for the lighting system is furnished by the Hamilton municipal electric light and power plant, in which the citizens take pride as well as in the new lighting system. The plant was described in THE AMERICAN CITY, in July, 1930 (page 101). The installation was paid for entirely from the earning of the plant, as part of the year's improvement program for that utility. This year approximately $200,000 is planned to be spent in other improvements, and all will be paid for from earnings. The municipal plant is so well operated and managed under our city-manager government that it is possible to make these improvements on a cash basis. The city is decreasing its bonded debt while at the same time securing many improvements, not only in connection with the lighting plant and system but in other directions also.

To City Manager R. P. Price and Director of Public Utilities C. N. Teaff is given much local credit for the lighting project. The Chamber of Commerce, Retail Merchants' Association and other civic bodies which urged the installation are proud of the accomplishment. Hamilton people also take satisfaction in the fact that the beautifully designed bases and brackets were molded for the Electric Railway Equipment Co. in the local H. P. Deuscher Co. foundries.

In the development of the new lighting arrangements for the business district the officials of Hamilton made a careful and thorough study of various systems, considering especially the diffusion of light, the beauty of the standards and the durability of the entire construction. The system now installed and so acceptable to everyone is to be extended as soon as funds are available for the work.

ASSEMBLING A STANDARD
The cast iron head is being hoisted to the top

A Floodlighted Stadium in Johnstown, Pa.

AT the "Point," formed by the junction of two watercourses at Johntown, Pa., the city has erected a large stadium for football and baseball games and other forms of athletics. It is operated under the supervision of the Municipal Recreation Commission, which operates in the Department of Parks and Public Property. Last fall Superintendent Dan R. Schnabel of this Department succeeded in carrying through the installation of a lighting system for the Stadium, which makes it possible to use the latter for night activities. Baseball was played under these lights with great success, not only from the standpoint of playing the game but from that of finances as well. Night football games were very popular during the past football season.

The cost of this installation was approximately $7,000 and the city's share of the proceeds of night baseball and football games has made it possible to pay more than half of the cost of this installation. All indications are that the entire cost of this lighting system will be paid in the course of the 1931 baseball season from the city's share of receipts from night games. At the time this matter was pending Superintendent Schnabel was so confident that it would be a paying proposition that he pledged his salary, if necessary, to pay for the lights if they did not pay for themselves.

The installation contains 96 1,500-watt Pittsburgh floodlights, 32 of them being mounted on top of the grandstand, which is 95 feet above the playing field. There are three sets of double poles, on each of which is mounted 17 lights. These poles are 55 feet out of the ground. One set of 13 floodlights is mounted on top of the press box opposite first base.

This is a temporary installation which will be succeeded later this year by four steel towers having a mounting height of 90 to 100 feet, and the units on top of the grandstand will be arranged in two groups at each end of the stand.

There is an illumination intensity of 50 foot-candles at home plate and 20 to 30 foot-candles in the rest of the infield. The outfield has an illumination of 10 to 20 foot-candles.

NIGHT BASEBALL GAME AT THE POINT STADIUM

Kittenball by Electric Light

SANTA BARBARA, CALIF., is one of many cities showing much interest in kittenball, or playground baseball. Four diamonds are laid out at the Santa Barbara State Teachers College and the games are played at night under 16 Giant Manufacturing Co. floodlight projectors, each using three 1,500-watt lamps. This equipment was installed for night football games by the College and is used in the summer for after-dark kittenball games. W. H. Orion, Director of Physical Education, has organized many teams into city leagues, and games are played four nights each week. The field, shown herewith, accommodates 80 players at once.

FOUR KITTENBALL GAMES IN PROGRESS AT NIGHT

Athletic Field Lighting That Pays for Itself

By GORDON E. NELSON
Commissioner of Buildings, Madison, Wis.

THE Municipal Athletic Field in Madison, Wis., more commonly known as the Breese Stevens Field, has been in existence for approximately seven years, during which time the investment has been solely a liability as far as any return upon the investment of the city is concerned. A group of electrical contractors in the city organized the Madison Electrical Decorating Co. and proposed to erect, at no direct expense to the city, a complete and up-to-date floodlighting system to permit night as well as day-time activities at the field. The total cost of this contract was $29,100. The installation consists of ten steel towers, 90 feet in height, having in all 93 lights of approximately 1,500 watts each. The equipment was manufactured by the Crouse-Hinds Company of Syracuse, N. Y.

The Mayor appointed a Promotion Committee, which schedules all events at the field, with particular attention to the promotion of night events. This Committee consists of members of the Decorating Company, Aldermen Gallagher and Lutz, and the writer. It is working in entire accord with the existing permanent standing committee of the Common Council known as the Athletic Committee, of which Alderman Gallagher is chairman. The Athletic Committee has charge of the physical properties of the Athletic Field, and formerly handled the scheduling of all events, but in order to avoid duplication of effort, and that there shall be no conflict in running the day events that might extend into the evening, this Committee has given the Promotion Committee practically the entire charge of all events at the field.

Without in any way committing the city to any liability in regard to the payment of the contract price of $29,100, it has been agreed that the city will assure to the Decorating Company payment of 45 per cent of the gross gate receipts at any contest or event at which a charge is made, and held on this field in the evening. This participation in gate receipts is to continue until full payment is made of the purchase price without interest. In case of events or programs by educational institutions in Madison the percentage of gate receipts payable to the contractor is 33⅓ per cent, and is computed on the basis of cash received at the gate only. The Decorating Company thus receives no percentage, applied to the contract price, on events that are held during the day, whether by local teams or by school teams. They receive only a percentage of the receipts on events which will use the lighting equipment.

Details of the Contract

The contractor was required to furnish liability insurance during the erection, and also during the full time of the contract, in an amount of $25,000, for the benefit of itself and the city, but the cost thereof was added to the contract price, and will be paid as a part of the contract price out of the gate receipts. The contractor further agreed, for the benefit of the city as well as for itself, to maintain due and appropriate insurance against any accident or injury to workmen and to the public during the period of installation, and agreed likewise to replace and repair during the period of the contract any defective equipment, and to make such repair and replacements as may be necessary to maintain the system efficiently, satisfactory to the Athletic Committee, until final and complete payment is made of the above contract price. The title to the property and all repairs, replacements, and accessories installed remains the contractor's, and unless full and complete payment is made within a period of five years from the date of signing the contract, the contractor will at the expiration of that time be authorized to remove the equipment from the premises.

The city may at any time permit the Breese Stevens Field to be used at night without charging any admission at the gate or otherwise, and no liability under the contract shall ensue thereby; furthermore, the use of the field otherwise and when the lighting equipment is not necessarily used shall not in any way obligate the city to the contractor, nor entitle the contractor to any portion of the gate receipts when so used. When full and final payment has been received by the contractor all of the equipment, towers and the entire floodlighting system with all replacements, repairs, and accessories thereto, free and clear of all incumbrances, shall become the property of the city. The contract creates no direct, present, future, or contingent indebtedness or liability against the city for payment to the contractor of the contract price, or any part thereof, except in case gate receipts have been received, in which event the city obligates itself to turn over to the contractor the percentages thereof as provided. The contractor was further required to carry insurance against damage or injury to the equipment by wind and storm, and against damage or injury thereto of malicious or wilful character by a third party, the cost thereof being added to the contract price and paid out of the gate receipts.

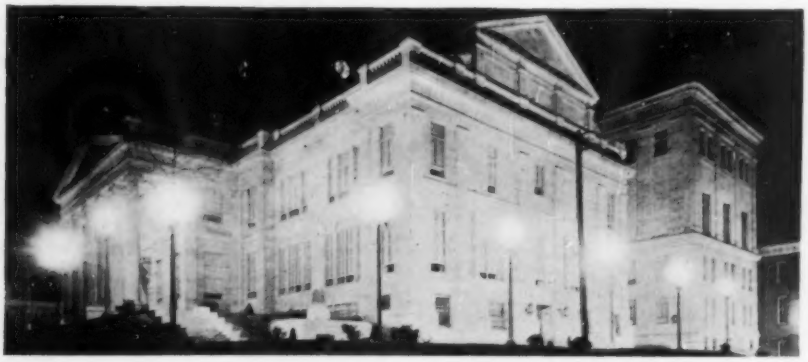
The Promotion Committee has engaged several very elaborate and attractive events for the night programs, including games with big league teams, rodeos, professional football, hockey, and all forms of sports.

From present indications we are assured of very good success in the fulfilling of the contract.

Floodlighted Courthouses

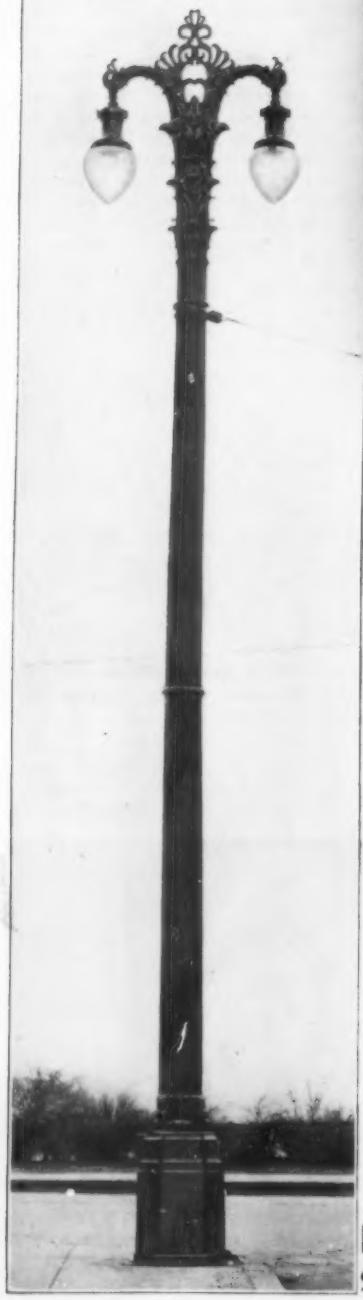
JASPER, ALA.

The dome of the Walker County Courthouse is illuminated by four 500-watt floodlights mounted on top of the wings



MONTGOMERY COUNTY COURTHOUSE, NORRISTOWN, PA.

The exterior of the court house and adjoining county buildings are lighted by 44 combined floodlighting and street-lighting G.E. units with 1,500-watt main lamps and 200-watt auxiliary lamps



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. . . . There Must Be A Good Reason

And there is — in fact there are five good reasons why ELRECO Lighting Standards are preferred:

1—The ELRECO Internal Tubular Reinforcing Pole extends without a break from the foundation to the top of the standard, providing a far greater factor of safety. If the base is broken, the standard cannot fall.

2—More space in the ELRECO Base for transformers and cut outs.

3—The ELRECO Base, cast in one piece, adds strength and stability to the standard.

4—The ELRECO Base is centered by the internal tubular pole and is not bolted to the foundation, thus permitting some movement when struck and preventing breakage.

5—ELRECO Fluted Columns are formed of one thickness of steel, eliminating rust from the collection of moisture which gathers when two thicknesses of light weight steel are formed one on top of the other.

6—ELRECO Fluted Columns have a longitudinal butt welded joint — a very superior type of construction.

7—ELRECO Standards are factory assembled and shipped as units — an important reason why contractors prefer to install them.

Facts and information on ELRECO superiority are always available to those interested. Write today for complete information.

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This photograph shows a good example of "ornamental" underground installation. Equally good illumination can be obtained with pendent luminaires that use the same glassware, which harmonizes with the luminaire and its surroundings.

GLEASON-TIEBOUT GLASSWARE WAS USED IN LIGHTING NAHANT STREET, LYNN, MASS., A RESIDENTIAL DISTRICT.

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Form 32 Series—Pendent Type Unit No. 146 —Rippled Outer Globe.

LUMINAIRES that harmonize with the architectural character of residential streets and boulevards have an economic as well as a decorative value. They add to the modern appearance and distinctive atmosphere of such areas, attract desirable residents, and so tend to enhance sales and rental values.

It is important that both luminaire and standard contribute to the unity and beauty of the whole, and it is especially important that the globe be designed and manufactured with special reference to its purpose.

Gleason-Tiebout glassware, with its attractive sparkle, carefully designed diffusion, and low maintenance, is scientifically and artistically adapted to the specific needs of any city area.

Gleason-Tiebout makes glassware to meet specifications of General Electric street-lighting engineers. These engineers will be glad to assist in planning installations that will exactly meet every requirement.

GLEASON-TIEBOUT GLASS COMPANY

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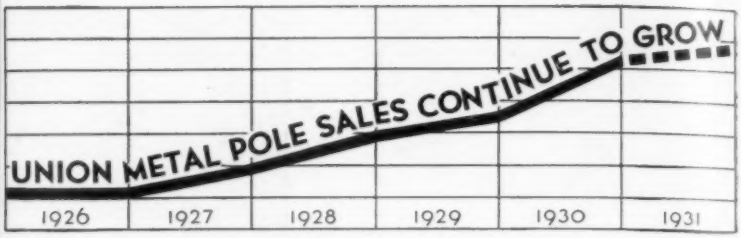

AN INCREASE in sales every year, with 1931 headed in the same direction! That is the story of the acceptance of Union Metal Poles by utility officials and the general public.

Today you will find Union Metal Fluted Steel Poles installed in Los Angeles, Cleveland, New Orleans, Chicago, Vancouver, Detroit, Kansas City, Pittsburgh and dozens of smaller municipalities. Each installation is tailored to order, and constructed to give trouble-free service for many long years.

Because they are fabricated from heavy steel and then cold-rolled, these poles withstand heavy side strains. And because of their strength—and appearance—one set of poles may be used to support trolley span wires, street lighting units, traffic signals, and distribution and transmission lines. The result is true economy for the users of the poles and a decided improvement in street appearance.

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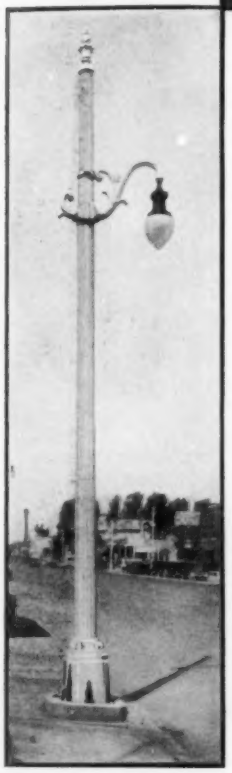
UNION METAL DISTRIBUTION POLES

One of the G-E luminaires on Woodward Avenue, mounted on a Union Metal Company pole



Let a G-E specialist show you the advantages of a "budgeted" lighting program with its cost spread over a period of years. Address the nearest G-E office, or Lighting Division, General Electric Company, Schenectady, N. Y

Woodward Avenue, Birmingham, Mich., illuminated with G-E Novalux luminaires—an example of planned lighting

Every City Program should begin with Planned Street Lighting

CORRECT street lighting will substantially increase the value of other programmed improvements. It should, therefore, from the very first, be made an integral part of coördinated city planning.

Installations laid out with future growth in view give the best protection to present and future traffic, discourage crime, promote business, and attract desirable residents.

Civic development follows the light. An installation that has been planned and made with specific reference to residential or commercial extension, or to "through" arteries, is a compelling factor in developing zones in accordance with definite plans.

General Electric engineers will be glad to help you plan *ahead* for installations so flexible that they may be progressively adapted to changing requirements. As an example, in certain streets of Hartford, Conn., four successive changes in illumination can be made without changing a pole or a cable.

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The new Benjamin Play Area Floodlight, No. 5752, meets every requirement for the modern lighting of outdoor sports and recreation, ground areas, apparatus and the area over the playing field.

Especially adapted for the lighting of Children's Playgrounds, Tennis Courts, Croquet Courts, Horseshoe Pitching Courts, Swimming Pools, etc.

Benjamin lighting equipment includes a complete line of floodlights and reflectors and other fixtures for indoor and outdoor lighting. Consult our Illuminating Engineering Service Department for practical suggestions and specifications.

Meet the Four Basic Requirements for the Lighting of Outdoor Recreational Areas

(A) Provides uniform and strong illumination on the ground and to the front and sides of the unit.

(B) Directs adequate light on vertical surfaces to be illuminated, such as players, apparatus and other objects.

(C) Directs part of the light into the upper areas permitting players and spectators to follow an object in flight such as a baseball or football.

(D) Minimizes annoying glare by shielding the lamp, and prevents it from interfering with the vision of players or spectators.

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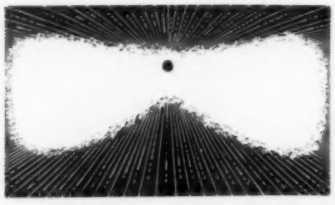
Holophane 4377
B-Way Refractor



Light Distribution
(Looking down from above)

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They provide the greatest amount of useful light

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Everybody loses when trees are trimmed like this.

The beauty and symmetry of these trees could have been preserved with FIBREX Tree Wire

A great majority of public utility companies are making a close study of tree preservation due to the many customer relation problems involved. The importance of proper methods of tree trimming is generally realized and tree experts employed by many utilities are doing fine work which is a credit both to the utility and to the community in which they operate.

However, when trees are cut like those shown in the photographs it certainly doesn't improve the appearance of the community and it does seriously impair the growth and life of the tree.

Where overhead distribution lines must run through trees it is no longer necessary to use the axe and saw because FIBREX Tree Wire can be installed without fear of injury to the trees or of interference to the service. To any community faced with the danger of having its shade trees damaged by installation or maintenance of overhead lines FIBREX Tree Wire is suggested as a solution of the problem.

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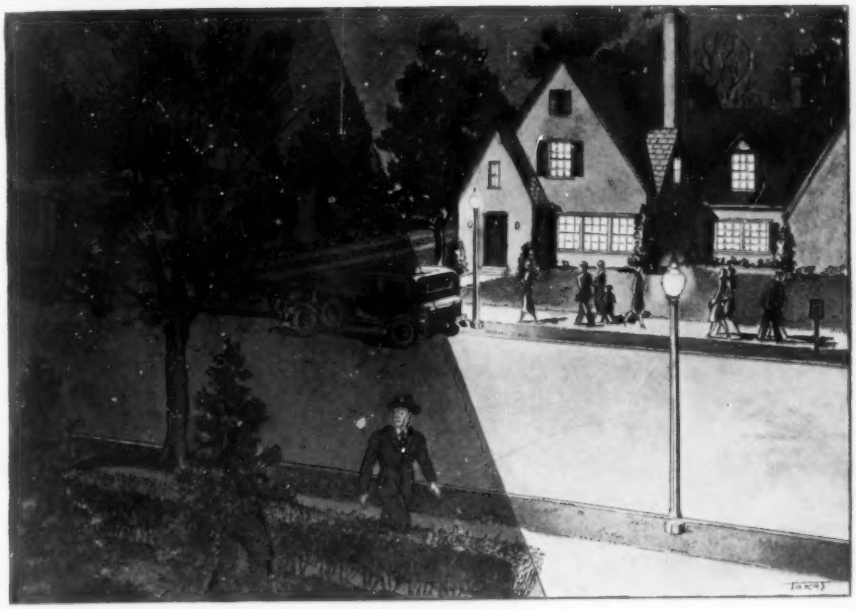
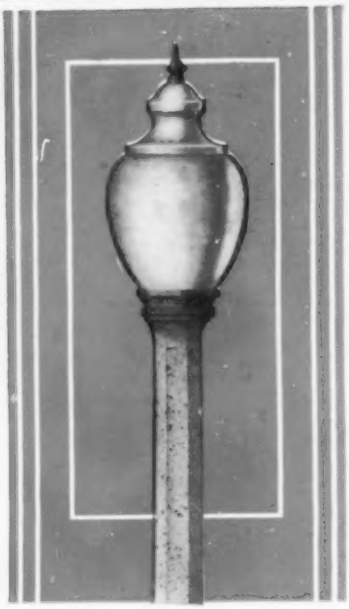
WHEN *Twilight Zone* SHADOWS ASK *"GOTTA MATCH?"*





IT IS midnight—the street is deserted; you listen to the sound of footfalls on the pavement. Are they your own, or someone else's tramping close behind? Then, out of the black shadows, a gruff voice asks, "Gotta match?"

Twilight Zone* streets are dangerous streets—a drag on civic development—they drive people home early. People are fearful of Twilight Zone shadows that ask, "Gotta match?"

Most streets, and especially residential streets, are only partially lighted. Old-fashioned bare lamps burn at the street corners making pools of light with long stretches of shadows between corners. Turn these stretches of shadows into a continuous path of light, where walking home is both safe and pleasant. Install a Westinghouse-planned street lighting system.

Municipal executives are invited to write to our nearest office for a new book, "Bringing Cities Out of the Twilight Zone."

**That deceptive half-light between obvious darkness and adequate illumination.*

Westinghouse Lighting Specialists will help you plan an effective lighting system

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Because chlorination plays a vital part in preservation of life and the conservation of capital, it plays an important part in the survival and progress of these towns. Since its first inception — in 1915 — W & T chlorine control apparatus has contributed largely to the reduction of the Nation's annual typhoid toll from 24 deaths per hundred thousand to less than 5 per hundred thousand.*

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New types of W & T equipment await your inspection — booths 36 — 40. Let us welcome you there.

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* Every town on the map has at least one W & T Chlorinator — most of them more than one, as indicated by figures in parentheses.

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